TARGA

811 Louisiana, Suite 2100
Houston, TX 77002
713.584.1000
www.targaresources.com

October 21, 2019

US EPA Region 8
1595 Wynkoop Street, 8P-AR
Denver, CO 80202

RE: True Minor Oil and Gas Source Registration – Part 1
Targa Badlands LLC
TAT-Blue Buttes Compressor Station Modifications
Fort Berthold Reservation, McKenzie County, North Dakota

Targa Badlands LLC (Targa) currently owns and operates the Three Affiliated Tribes (TAT)-Blue Buttes Compressor Station, a natural gas compressor station (SIC 1311, NAICS 211111) located within the exterior bounds of the Fort Berthold Indian Reservation in McKenzie County, North Dakota.

Targa is submitting the required information to register a minor modification to the facility under the Federal Implementation Plan (FIP) for True Minor Oil and Gas Sources. The proposed minor modification includes the following:

- One new compressor engine (EU 29);
- One new produced water tank (EU 30) and associated increase in loading (EU 8);
- Two new condensate tanks (EU 31 and 32) and associated increase in loading (EU 13);
- Additional glycol dehydrator throughput (EU 15);
- Updated fugitive emissions associated with equipment leak components (EU 10);
- An additional lubricating oil tank (EU 33)
- An additional coolant oil tank (EU 34).

The site is currently a minor source registered under Part 49 and will remain a minor source after the completion of the modifications to the site. This application satisfies the requirements to submit the Part 1 information at least 30 days prior to start of construction of the facility. The Part 1 Form, Modification Narrative, updated Environmental Species Act (ESA) and National Historic Preservation Act (NHPA) reviews, and the EPA concurrence letter are attached to this letter. The original EPA concurrence letter, ESA and NHPA reviews are also attached. If you have any questions or comments about the information presented in this letter or the attached materials, please do not hesitate to call me at (713) 584-1292.

Sincerely,

Tammy Wallace

Tammy Wallace
Senior Environmental Specialist
Targa Badlands LLC

Enclosures

cc: Dwayne Burks, Targa
Rydell Klosterman, Trinity Consultants

TRUE MINOR OIL AND GAS SOURCE REGISTRATION
FEDERAL IMPLEMENTATION PLAN – PART 1

Targa Badlands LLC > TAT-Blue Buttes Compressor Station

TARGA

TARGA BADLANDS LLC

811 Louisiana Street, Suite 2100
Houston, TX 77002

Prepared By:

TRINITY CONSULTANTS
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October 2019

Project 192401.0059

Trinity Consultants

Environmental solutions delivered uncommonly well

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Targa Badlands LLC (Targa) is herein submitting the required information to register a minor modification at the Three Affiliated Tribes (TAT)-Blue Buttes Compressor Station under the Federal Implementation Plan (FIP) for True Minor Oil and Gas Sources per the requirements of Title 40 of the Code of Federal Regulations (40 CFR) Part 49. The site is used to compress and dehydrate natural gas from nearby wells (SIC 1311, NAICS 211111). The TAT-Blue Buttes Compressor Station is a true minor source that is located within the exterior bounds of the Fort Berthold Indian Reservation in McKenzie County, North Dakota. The site is currently registered under Part 49. The TAT-Blue Buttes CS began operations on December 6, 2017. At the time of operations the facility's potential to emit was greater than 100 tpy of the criteria pollutants carbon monoxide (CO) and volatile organic compounds (VOC) making the facility a major source per 40 CFR 71.2 and subject to the Part 71 Title V permitting requirements of 40 CFR 71.3(a)(1). Per CFR 71.5(a)(1), an initial Part 71 Title V application was submitted on December 6, 2018. At the time of this modification, the permit has not been issued.

As part of this submittal, Targa is proposing to install the following components and update the PTE of existing components based on increased throughput at the facility:

- One new compressor engine (EU 29);
- One new produced water tank (EU 30) and associated increase in loading (EU 8);
- Two new condensate tanks (EU 31 and 32) and associated increase in loading (EU 13);
- Additional glycol dehydrator throughput (EU 15);
- Updated fugitive emissions associated with equipment leak components (EU 10);
- An additional lubricating oil tank (EU 33); and
- One coolant tank (EU 34).

This application satisfies the requirements to submit the Part 1 information at least 30 days prior to start of construction of the facility. The Part 1 Form is provided in Appendix A of the application. An update to the Environmental Species Act (ESA) and National Historic Preservation Act (NHPA) review, which is required to be submitted along with the Part 1 Form, is provided in Appendix B.

1.1. GENERAL APPLICANT INFORMATION

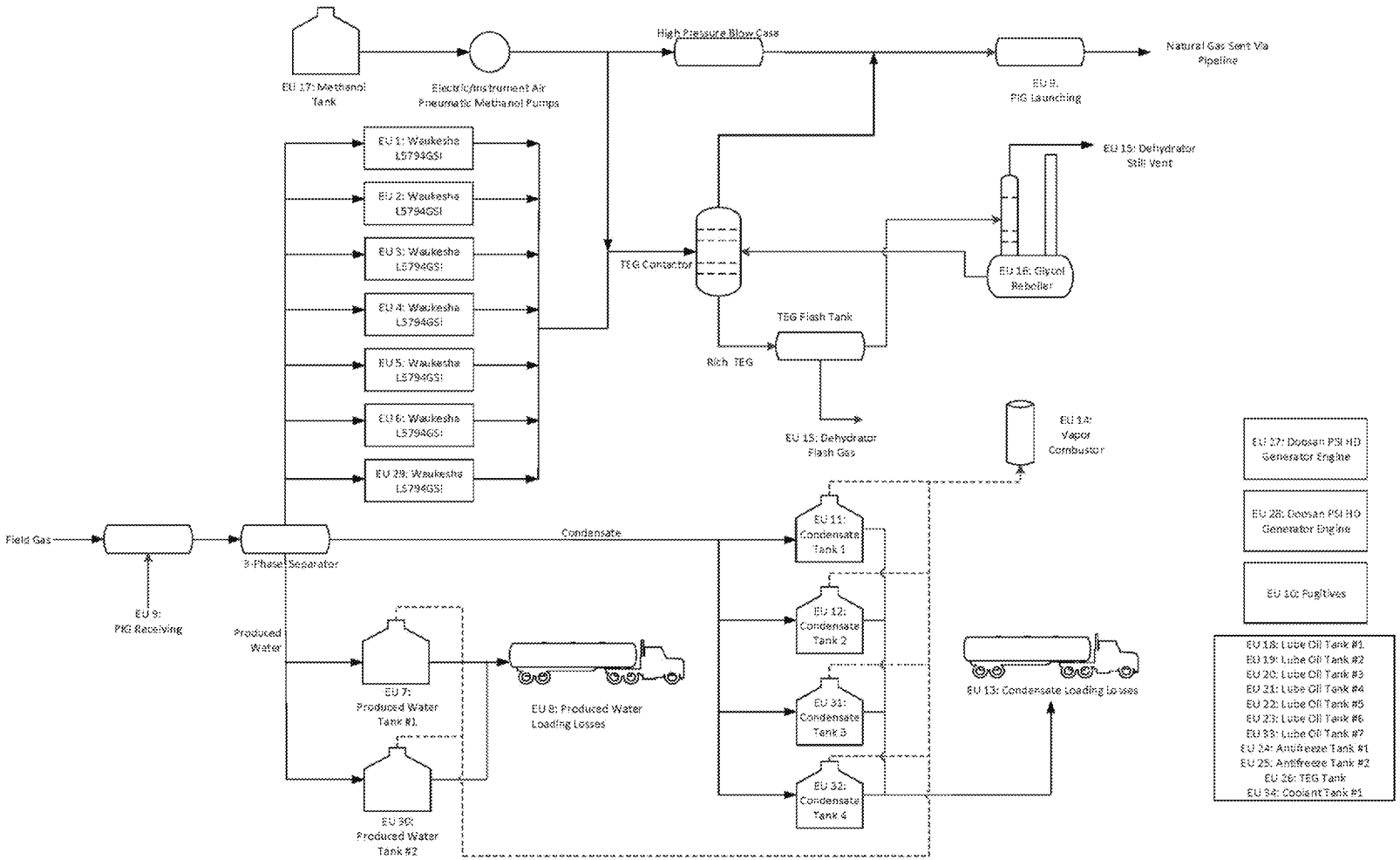
Listed below are the points of contact for the TAT-Blue Buttes Compressor Station registration application. This information is also provided in the application forms provided in Appendix A.

Project Site:	Targa Badlands LLC – TAT-Blue Buttes Compressor Station NW 1/4, NE 1/4, S31, T151N, R94W McKenzie County, North Dakota
Applicant Contact:	Tammy Wallace Senior Environmental Specialist Targa Badlands LLC 811 Louisiana Street Suite 2100 Houston, Texas 77002

2.1. DESCRIPTION OF OPERATIONS

Inlet gas flows from gas lines to a 3-phase separator, where liquids are gravimetrically separated. Produced water and condensate are directed to the produced water and condensate tanks, respectively, and trucked from the facility. Both the produced water and condensate tanks are controlled by a vapor combustor. The overhead gas is compressed and dehydrated before being discharged to the gathering pipeline. The rich glycol is first directed to a flash tank to remove entrained hydrocarbons before being sent to the glycol reboiler. The glycol reboiler vapor stream is directed to the same vapor combustor as the tanks, but can also vent to the atmosphere. Methanol is injected at different points in the process using pneumatic pumps to prevent hydrates from forming; however, as these pneumatic pumps will be either instrument air or electric, they will not have emissions, and thus are not discussed further in this application. Similarly, the pneumatic controllers onsite will be instrument air and the tank heaters will be electric; these units will also have no emissions, and will not be discussed further in this application. Generator engines provide power to the facility. A process flow diagram is presented in Section 2-2.

2.2. PROCESS FLOW DIAGRAM



2.3. IDENTIFICATION OF EMISSION UNITS

A complete list of the proposed emission units at the site can be found in Table 2-1. Table 2-1 includes the proposed Emission Unit ID (EU) and Emission Point Number (EPN) for each unit at the site, as well as equipment descriptions of each emission unit in this Part 49 Registration modification where applicable.

Table 2-1. Emission Unit Summary

Emission Unit ID	Emission Point ID	Description	Capacity/Rating
1	1	Waukesha L5794GSI	1,380 hp
2	2	Waukesha L5794GSI	1,380 hp
3	3	Waukesha L5794GSI	1,380 hp
4	4	Waukesha L5794GSI	1,380 hp
5	5	Waukesha L5794GSI	1,380 hp
6	6	Waukesha L5794GSI	1,380 hp
7	7	Produced Water Tank #1	400 bbl
8	8	Produced Water Loading Losses	82.20 bbl/day
9	9	PIG Launchers/Receivers	-
10	10	Fugitive Emissions	-
11	14	Condensate Tank #1	400 bbl
12	14	Condensate Tank #2	400 bbl
13	13	Condensate Loading Losses	255.00 bbl/day
14	14	Vapor Combustor	-
15	15	Dehy Process Vents	42 MMscfd
16	16	Glycol Reboiler	0.675 MMBtu/hr
17	17	Methanol Storage Tank	2,000 gal
18	18	Lube Oil Tank #1	500 gal
19	19	Lube Oil Tank #2	500 gal
20	20	Lube Oil Tank #3	500 gal
21	21	Lube Oil Tank #4	500 gal
22	22	Lube Oil Tank #5	500 gal
23	23	Lube Oil Tank #6	500 gal
24	24	Antifreeze Tank #1	500 gal
25	25	Antifreeze Tank #2	500 gal
26	26	TEG Tank	500 gal
27	27	Doosan/PSI FPSIB21.9NGP	507 hp
28	28	Doosan/PSI FPSIB21.9NGP	507 hp
29	29	Waukesha L5794GSI	1,380 hp
30	30	Produced Water Tank #2	400 bbl
31	31	Condensate Tank #3	400 bbl
32	32	Condensate Tank #4	400 bbl
33	33	Lube Oil Tank #7	500 gal
34	34	Coolant Tank #1	500 gal

2.4. OPERATING SCHEDULE

The site operates 24 hours per day, 7 days per week, and 52 weeks per year (8,760 hours per year). Targa expects to begin construction of the new equipment in November 2019, and to start operation of the new equipment soon after construction is complete.

2.5. AIR POLLUTION CONTROL

Table 2-2 lists the control devices currently installed, or that Targa will install as part of this project, at the TAT-Blue Buttes Compressor Station. This table also lists the federal regulation requiring the control equipment, such as New Source Performance Standards (NSPS) found in 40 CFR Part 60 or National Emission Standards for Hazardous Air Pollutants (NESHAP) found in 40 CFR Part 63. All other equipment onsite is uncontrolled.

Emission Unit ID	Emission Point ID	Description	Controls	Control Requirement
EU 1	EPN 1	Waukesha L5794GSI	NSCR	NSPS JJJJ/NESHAP ZZZZ
EU 2	EPN 2	Waukesha L5794GSI	NSCR	NSPS JJJJ/NESHAP ZZZZ
EU 3	EPN 3	Waukesha L5794GSI	NSCR	NSPS JJJJ/NESHAP ZZZZ
EU 4	EPN 4	Waukesha L5794GSI	NSCR	NSPS JJJJ/NESHAP ZZZZ
EU 5	EPN 5	Waukesha L5794GSI	NSCR	NSPS JJJJ/NESHAP ZZZZ
EU 6	EPN 6	Waukesha L5794GSI	NSCR	NSPS JJJJ/NESHAP ZZZZ
EU 7	EPN 7	Produced Water Tank #1	Vapor Combustor (EU 14)	N/A (Not Subject to NSPS OOOOa as PTE < 6 tpy). No controls are claimed in calculating emissions for this unit.
EU 11	EPN 14	Condensate Tank #1	Vapor Combustor (EU 14)	NSPS OOOOa
EU 12	EPN 14	Condensate Tank #2	Vapor Combustor (EU 14)	NSPS OOOOa
EU 27	EPN 27	Doosan/PSI FPSIB21.9NGP	NSCR	NSPS JJJJ/NESHAP ZZZZ
EU 28	EPN 28	Doosan/PSI FPSIB21.9NGP	NSCR	NSPS JJJJ/NESHAP ZZZZ
EU 29	EPN 29	Waukesha L5794GSI	NSCR	NSPS JJJJ/NESHAP ZZZZ
EU 30	EPN 30	Produced Water Tank #2	Vapor Combustor (EU 14)	N/A (Not Subject to NSPS OOOOa as PTE < 6 tpy). No controls are claimed in calculating emissions for this unit.
EU 31	EPN 31	Condensate Tank #3	Vapor Combustor (EU 14)	NSPS OOOOa
EU 32	EPN 32	Condensate Tank #4	Vapor Combustor (EU 14)	NSPS OOOOa

2.6. COMPLIANCE MONITORING DEVICES/ACTIVITIES

In order to demonstrate compliance with applicable FIP requirements, Targa will perform applicable monitoring and testing per applicable NSPS and/or MACT regulations contained in the FIP. For sources that are not subject to any monitoring and testing requirements in the NSPS and/or MACT regulations, Targa will utilize industry best management practices and will maintain and operate site equipment per manufacturer recommendations to minimize air emissions.

APPENDIX A: TRUE MINOR SOURCE FIP REGISTRATION FORM - PART 1

EPA Form No. 5900-390
EPA ICR No. 1230.27
OMB Control No. 2060-0003
Approval expires 10/31/2020

United States Environmental Protection Agency
https://www.epa.gov/tribal-air/tribal-minor-new-source-review
April 29, 2019

Part 1: Submit 30 Days Prior to Beginning Construction -- General Facility Information

FEDERAL IMPLEMENTATION PLAN FOR TRUE MINOR SOURCES IN INDIAN COUNTRY IN THE OIL AND NATURAL GAS PRODUCTION AND NATURAL GAS PROCESSING SEGMENTS OF THE OIL AND NATURAL GAS SECTOR

Registration for New True Minor Oil and Natural Gas Sources and Minor Modifications at Existing True Minor Oil and Natural Gas Sources

Please submit information to:

[Reviewing Authority Address Phone]	US EPA Region 8 1595 Wynkoop Street, 8P-AR Denver, CO 80202

A. GENERAL SOURCE INFORMATION (See Instructions Below)

1. Company Name Targa Badlands LLC		**2. Source Name** TAT - Blue Buttes Compressor Station	
3. Type of Oil and Natural Gas Operation Natural Gas Compression and Dehydration		**4. New Minor Source?** ☐ Yes ■ No Existing **5. Minor Source Modification?** ■ Yes ☐ No	
6. NAICS Code 211111		**7. SIC Code** 1311	
8. U.S. Well ID(s) or API Number(s) [if applicable] N/A			
9. Area of Indian Country Fort Berthold Indian Reservation NW 1/4, NE 1/4, S31, T151N, R942	**10. County** McKenzie	**11a. Latitude** 47.86107	**11b. Longitude** -102.758167

B. CONTACT INFORMATION (See Instructions Below)

1. Owner Name Dwayne Burks	Title VP Operations
Mailing Address 110 West 7th, Suite 2300, Tulsa, OK 74119	
Email Address hburks@targaresources.com	
Telephone Number 918-571-3862	Facsimile Number 713-584-1522
2. Operator Name (if different from owner) Same as Company Contact	Title
Mailing Address	
Email Address	
Telephone Number	Facsimile Number
3. Source Contact Tammy Wallace	Title Senior Environmental Specialist
Mailing Address 811 Louisiana Street, Suite 2100, Houston, TX 77002	
Email Address twallace@targaresources.com	
Telephone Number 713-584-1292	Facsimile Number 713-584-1522

4. Compliance Contact	Title
Mitchell Anderson	Senior Environmental Specialist
Mailing Address: 1939 125th Ave. NW, Watford City, ND 58854	
Email Address: mitchellanderson@targaresources.com	
Telephone Number: 701-842-3315	Facsimile Number

C. ATTACHMENTS

Include all of the following information as attachments to this form:

- [x] Narrative description of the operations.
- [x] Identification and description of all emission units and air pollution generating activities (with the exception of the exempt emissions units and activities listed in §49.153(c).
- [x] Identification and description of any air pollution control equipment and compliance monitoring devices or activities that are expected to be used at the facility.
- [x] Estimated operating schedules.
- [ ] If satisfying the requirements under §49.104(a)(1), documentation that another federal agency has complied with its requirements under the Endangered Species Act (ESA) and the National Historic Preservation Act (NHPA) when authorizing the activities for the facility/activity covered under this registration. The appropriate documents shall clearly show that the other federal agency had met its obligations under both the ESA and NHPA. A simple reference to a Record of Decision or other final decision document will not be acceptable. Examples of acceptable documentation would be a letter from the U.S. Fish and Wildlife Service field office (for ESA) or a historic preservation office (for NHPA) stating they agree with the assessment conducted by the other federal agency for the subject project and that the requirements of those statutes have been met. The documentation shall be submitted within the Part 1 registration.
- [x] If satisfying the requirements under §49.104(a)(2), the letter provided by the Reviewing Authority indicating satisfactory completion of the specified screening procedures to address threatened or endangered species and historic properties. The documentation shall be submitted under the Part 1 registration. (The procedures are contained in the following document: "Procedures to Address Threatened or Endangered Species and Historic Properties for the Federal Implementation Plan for True Minor Sources in Indian Country in the Oil and Natural Gas Production and Natural Gas Processing Segments of the Oil and Natural Gas Sector," https://www.epa.gov/tribal-air/tribal-minor-new-source-review).
- [ ] Other.

Instructions for Part 1

Please answer all questions. If the item does not apply to the source and its operations write "n/a". If the answer is not known write "unknown".

A. General Source Information

1. Company Name: Provide the complete company name. For corporations, include divisions or subsidiary name, if any.
2. Source Name: Provide the source name. Please note that a source is a site, place, or location that may contain one or more air pollution emitting units.
3. Type of Operation: Indicate the generally accepted name for the oil and natural gas production or natural gas processing segment operation (e.g., oil and gas well site, tank battery, compressor station, natural gas processing plant).
4. New True Minor Source: [Per Federal Indian Country Minor New Source Review Rule, 40 CFR 49.153].
5. True Minor Source Modification: [Per Federal Indian Country Minor New Source Review Rule, 40 CFR 49.153].
6. North American Industry Classification System (NAICS): The NAICS Code for your oil and natural gas source can be found at the following link for North American Industry Classification System: http://www.census.gov/eos/www/naics/.
7. Standard Industrial Classification Code (SIC Code): Although the new NAICS code has replaced the SIC codes, much of the Clean Air Act permitting processes continue to use these codes. The SIC Code for your oil and natural gas source can be found at the following link for Standard Industrial Classification Codes: http://www.osha.gov/pls/imis/sic_manual.html.
8. U.S. Well ID or API Number: Unique well identifier as assigned by the Federal or State oil and gas regulatory agency with primacy, using the American Petroleum Institute (API) Standard for number format (pre-2014) or the Professional Petroleum Data Management (PPDM) Association US Well Number Standard (2014-present). Provide IDs for all oil and natural gas production wells associated with the facility, if applicable. May not be applicable for downstream production sources, such as compressor stations.
9. Area of Indian Country: Provide the name of the Indian reservation within which the source is operating.
10. County: Provide the County within which the source is operating.
11. Latitude & Longitude (11a. and 11b.): Provide latitude and longitude location(s) in decimal degrees, indicating the datum used in parentheses. These are GPS (global positioning system) coordinates. This information should be provided in decimal degrees with 6 digits to the right of the decimal point, indicating the datum used in parentheses (i.e., NAD 27, NAD 83, WGS 84 – WGS 84 is preferred over NAD 27).

B. Contact Information

Please provide the information requested in full.

1. Owners: List the full name (last, middle initial, first) of all owners of the source.
2. Operator: Provide the name of the operator of the source if it is different from the owner(s).
3. Source Contact: The source contact must be the local contact authorized to receive requests for data and information.
4. Compliance Contact: The compliance contact must be the local contact responsible for the source's compliance with this rule. If this is the same as the Source Contact please note this on the form.

C. Attachments

The information requested in the attachments will enable the U.S. Environmental Protection Agency (EPA) to understand the type of oil and natural gas source being registered.

Disclaimers:

The public reporting and recordkeeping burden for this collection of information is estimated to average 6 hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

Information in these forms submitted in compliance with the final Federal Indian Country Minor New Source Review rule may be claimed as confidential. A company may assert a claim of confidentiality for information submitted by clearly marking that information as confidential. Such information shall be treated in accordance with EPA's procedures for information claimed as confidential at 40 CFR part 2, subpart B, and will only be disclosed by the means set forth in the subpart. If no claim of confidentiality accompanies the report when it is received by EPA, it may be made public without further notice to the company (40 CFR 2.203).

APPENDIX B: ENDANGERED SPECIES ACT AND NATIONAL HISTORIC PRESERVATION ACT REVIEW DOCUMENTATION

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 8
1595 Wynkoop Street
Denver, CO 80202-1129
Phone 800-227-8917
www.epa.gov/region8

Ref: 8ARD-PM

Ms. Tammy H. Wallace
Senior Environmental Specialist
Targa Resources LLC
811 Louisiana, Suite 2100
Houston, Texas 77002

Dear Ms. Wallace:

Thank you for your submittal, dated October 9, 2019, transmitting documentation of your procedures to address threatened and endangered species (TES) and historic properties for the proposed construction of a modification of the TAT-Blue Buttes Compressor Station under the Federal Implementation Plan for True Minor Sources in Indian Country in the Oil and Natural Gas Production and Natural Gas Processing Segments of the Oil and Natural Gas Sector. In accordance with 40 CFR 49.104(a)(2), you must obtain written confirmation from the U.S. Environmental Protection Agency, Region 8 that you have satisfactorily addressed the procedures before submitting the Part 1 General Facility Information Registration form at least 30 days prior to beginning construction.

This letter serves as written confirmation that the Targa Resources, LLC has satisfactorily completed the procedures to address TES and historic properties for the proposed construction of a modification of the TAT-Blue Buttes Compressor Station located on Indian country lands within the Fort Berthold Indian Reservation. The documentation submitted supports your findings of no effects to TES (Criterion A of the screening procedures) and that no historic properties would be affected by the project. Upon receipt of this letter, you may submit the Part 1 General Facility Information Registration form at least 30 days prior to beginning construction of the project.

If you have any questions or concerns, please contact Joseph Byron, of my staff, at (303) 312-6496 or byron.joseph@epa.gov .

Sincerely,

10/16/2019

X Carl Daly
Carl Daly

Signed by: CARL DALY
Carl Daly
Acting Director
Air and Radiation Division

cc: Edmond Baker, Environmental Director, Fort Berthold Indian Reservation

SWCA
ENVIRONMENTAL CONSULTANTS
Sound Science. Creative Solutions.®

Bismarck Office
116 North 4th Street, Suite 200
Bismarck, North Dakota 58501
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October 9, 2019

Kelsey Gocke
ES&H Environmental Specialist
Targa Resources
811 Louisiana Street, Suite 2100
Houston, Texas 77002

Re: Class I Cultural Resource Inventory, TAT-Blue Buttes Compressor Station

Dear Ms. Gocke:

On October 1, 2019, SWCA Environmental Consultants (SWCA) completed an updated Class I cultural resource inventory in support of the existing Targa Resources (Targa) TAT-Blue Buttes compressor station. Targa proposes to add one compressor and engine, two condensate tanks, one produced water tank, and fugitive components to the existing compressor station. No additional disturbance is proposed. The compressor station is fully within areas surveyed in 2011[1, 2] and 2017.[3] The TAT-Blue Buttes compressor station is located in the NWNE of Section 31, Township (T) 151 North (N), Range (R) 94 West (W), in McKenzie County, North Dakota, within the exterior boundaries of the Fort Berthold Indian Reservation. This letter report provides a description of the methods used by SWCA archaeologist Laci Paul to complete the updated Class I survey, and the results as they relate to the proposed project.

CLASS I SURVEY METHODS AND RESULTS

SWCA conducted a background search of archaeological and historical literature and records for the project area and surrounding 1-mile study area on October 1, 2019. For the updated Class I survey, researchers reviewed relevant record holdings at the State Historical Society of North Dakota for information regarding previously recorded historic and prehistoric archaeological sites or historic buildings located within the project area, and also reviewed the Bureau of Land Management General Land Office historic survey plats. A map illustrating the combined search results within the 1-mile study area is attached as Figure 1.

Based on the records search results, 22 previous inventories and investigations conducted for the purposes of identifying cultural resources have been conducted in the 1-mile study area between 1985 and 2018 (Table 1). The inventories were primarily conducted for oil and gas development of the area, including

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[1] Baer, Sarah, and Michael Retter. 2011. *A Class I and Class III Cultural Resource Inventory of the Independence Grace #150-94-06A-07H, Shell Creek #150-94-06A-07H TF, Nishu #150-94-06B-07H, and Sanish #150-94-06B-07H TF Well Pad and Access Road/Utility Corridor, Fort Berthold Indian Reservation, McKenzie County, North Dakota.* Manuscript number 012971. SWCA Environmental Consultants, Bismarck, North Dakota.

[2] Macy, Jennifer. 2011. *Blue Buttes Natural Gas Gathering Line: A Class III Cultural Resource Investigation in McKenzie County.* Manuscript number 012811. KLJ, Bismarck, North Dakota.

[3] Schleicher, Jolene. 2017. *A Class I and Class III Cultural Resources Inventory for the Blue Buttes Loop Compressor Station and Access Road, Fort Berthold Indian Reservation, McKenzie County, North Dakota.* Manuscript number 017485. SWCA Environmental Consultants, Bismarck, North Dakota.

well pads, access roads, and pipelines. Additional inventories were conducted for homesites, electrical lines, and road projects. The existing compressor station is fully within areas covered by three previous cultural resource inventories (manuscript numbers 012811, 012971, and 017485).

Results of the background search identified 11 previously recorded cultural resources (prehistoric and historic archaeological sites and isolated finds and historic architectural sites) located in the 1-mile study area (Table 2). The cultural resources consist of four cairn sites of unknown cultural or temporal origin; one prehistoric stone circle and other rock features site; one prehistoric stone circle, other rock features, and cultural material scatter site; one prehistoric stone circle site; one historic cultural material scatter, depression, dump, foundation, and machinery site; one prehistoric cultural material scatter site; one historic glass insulator isolated find; and one prehistoric chipped stone isolated find. One site (32MZ2377) and both isolated finds are recommended not eligible for inclusion in the National Register of Historic Places (NRHP). The remaining eight sites are unevaluated regarding their NRHP eligibility. The existing TAT-Blue Buttes compressor station avoids all cultural resources by more than 75 feet. The addition of the compressor and engine and associated tanks will have no impact on known cultural resources.

One unnamed trail was shown crossing the northern half of Section 31, T151N, R941W on the 1914 General Land Office map.[4] The trail appears to cross the southern portion of the compressor station; however, archaeologists did not identify the trail during the 2017 survey.[5]

Table 1. Previous Inventories

Manuscript Number	Location	Title	Authors	Year
003223	Sections 29 and 32, T151N, R94W	A Cultural Resource Inventory of Arma Geophysical Antelope and Spotted Horn Prospects, Fort Berthold Indian Reservation, McKenzie Co., North Dakota (UW# 845).	R. Christensen, D. Kuehn	1985
003857	Sections 29–31, T151N, R94W; Sections 25 and 36, T151N, R95W; Sections 5 and 6, T150N, R94W; Section 1, T150N, R95W	A Cultural Resource Inventory of ARMA Geophysical Antelope and Spotted Horn Prospects, Fort Berthold Indian Reservation, McKenzie County, North Dakota (UW #845)	R. Christensen, D. Kuehn	1985
004133	Sections 30 and 31, T151N, R94W; Sections 5 and 6, T150N, R94W; Section 36, T151N, R95W; Section 1, T150N, R95W	A Cultural Resource Inventory of Petty Ray Geophysical Seismic Lines on the Fort Berthold Indian Reservation, McKenzie County, North Dakota	L. Blikre, D. Kuehn	1986
004641	Section 29, T151N, R94W	Through the Glass Lightly: A Cultural Resources Inventory of the Arlie Knight Homesite, Fort Berthold Agency, McKenzie County, North Dakota	K. Banks	1988
010483	Section 1, T150N, R95W	BakkenLink Pipeline Beaver Lodge to Dry Creek: Phase II of the BakkenLink Pipeline in McKenzie and Williams Counties, North Dakota	A. Kulevsky	2014

[4] North Dakota State Water Commission. 2019. North Dakota State Benchmarks. Available at: http://survey.swc.nd.gov/. Accessed October 1, 2019.
[5] Schleicher, Jolene. 2017. *A Class I and Class III Cultural Resources Inventory for the Blue Buttes Loop Compressor Station and Access Road, Fort Berthold Indian Reservation, McKenzie County, North Dakota.* Manuscript number 017485. SWCA Environmental Consultants, Bismarck, North Dakota.

Manuscript Number	Location	Title	Authors	Year
010791	Section 29, T151N, R94W	Saddle Butte Pipeline: A Class III Cultural Resource Inventory, McKenzie and Dunn Counties, North Dakota	W. Burns	2008
012625	Section 30, T151N, R94W	A Class I and Class III Cultural Resource Inventory of the Bird #30-31H Well Pad and Utility Corridor, Fort Berthold Indian Reservation, McKenzie County, North Dakota	C. Herson, A. Lantz	2011w
012629	Section 5, T150N, R94W	A Class I and Class III Cultural Resource Inventory for the Hall #5-11H Well Pad and Access Road, Fort Berthold Indian Reservation, McKenzie County, North Dakota	T. Kohler	2011
012762	Section 31, T151N, R94W; Sections 25 and 36, T151N, R95W; Section 1, T150N, R95W	RTA Main Natural Gas Gathering Line: A Class III Cultural Resource Inventory, McKenzie County, North Dakota	S. Asbury, J. Macy	2011
012811	Sections 30 and 31, T151N, R94W; Section 36, T151N, R95W	Blue Buttes Natural Gas Gathering Line: A Class III Cultural Resource Investigation in McKenzie County, North Dakota	J. Macy	2011
012971	Section 31, T151N, R94W; Section 6, T150N, R94W	A Class I and Class III Cultural Resource Inventory of the Independence Grace #150-94-06A-07H, Shell Creek #150-94-06A-07H TF, Nishu #150-94-06B-07H, and Sanish #150-94-06B-07H TF Well Pad and Access Road/Utility Corridor, Fort Berthold Indian Reservation, McKenzie County, North Dakota	S. Baer, M. Retter	2011
013010	Section 36, T151N, R95W; Section 1, T150N, R95W; Section 31, T151N, R94W; Section 6, T150N, R94W	A Class I and Class III Cultural Resource Inventory of the Ruby #31-30H Well Pad and Utility Corridor, Fort Berthold Indian Reservation, McKenzie County, North Dakota	C. Herson	2012
013227	Section 31, T151N, R94W	WPX Energy's Ruby Parshall (aka Bird Infill 151-94-31) Well Pad: A Class III Cultural Resource Inventory, Fort Berthold Reservation, McKenzie County, North Dakota	W. Bluemle	2012
013372	Section 29, T151N, R94W	A Class I and Class III Cultural Resource Inventory of the Lucy Evans #29-32H Well Pad and Utility Corridor, Fort Berthold Indian Reservation, McKenzie County, North Dakota	A. Leroy	2012
013403	Section 36, T151N, R95W; Section 6, T150N, R94W; Section 1, T150N, R95W	A Class I and Class III Cultural Resource Inventory of the Nishu #150-94-06B-07H and Sanish #150-94-06B-07H TF Well Pad, Borrow Pit and Access Road/Utility Corridor, Fort Berthold Indian Reservation, McKenzie County, North Dakota	S. Baer	2012
015704	Section 31, T151N, R94W; Section 36, T151N, R95W	A Class I and Class III Cultural Resource Inventory of the Paradigm Sacagawea Pipeline, McKenzie and Mountrail Counties, North Dakota	A. McCarty, C. Riordan	2015
015832	Sections 29 and 30, T151N, R94W	A Class I and Class III Cultural Resource Inventory of the Delores Sand #29-32H/Lucy Evans #29-32H Underground Electric Line, Fort Berthold Indian Reservation, McKenzie County, North Dakota	M. Cox, T. Dunagan	2014
016489	Section 31, T151N, R94W	A Class I and Class III Cultural Resource Inventory of the Pipit 31-30H Well Pad and Access Road, Fort Berthold Indian Reservation, McKenzie County, North Dakota	C. Wandler	2015

Manuscript Number	Location	Title	Authors	Year
016508	Section 31, T151N, R94W	Addendum to A Class I and Class III Cultural Resource Inventory of the Pipit 31-30H Well Pad and Access Road, Fort Berthold Indian Reservation, McKenzie County, North Dakota, Due to Project Modifications	M. Cox	2015
017485	Sections 30 and 31, T151N, R94W	A Class I and Class III Cultural Resources Inventory for the Blue Buttes Loop Compressor Station and Access Road, Fort Berthold Indian Reservation, McKenzie County, North Dakota	J. Schleicher	2017
017633	Section 31, T151N, R94W; Section 36, T151N, R95W	A Class I and Class III Cultural Resource Inventory of the WPX Bird 2 Well Pad and Access Road, Fort Berthold Indian Reservation, McKenzie County, North Dakota	P. Swader	2017
017850	Section 31, T151N, R94W	Cultural Resource Monitoring of Topsoil Removal for the WPX Ruby Parshall Well Pad and Access Road, Fort Berthold Indian Reservation, McKenzie County, North Dakota	W. Harding	2018

Table 2. Previously Recorded Resources

Site Number	Legal Location	Site Type	Cultural Affiliation	NRHP Eligibility
32MZ759	E½ NW¼ SE¼, NWNWSE Section 25, T151N, R95W	Stone Circle, Other Rock Features, Cultural Material Scatter	Unknown Prehistoric	Unevaluated
32MZ815	SESESW Section 30, T151N, R94W	Stone Circle	Unknown Prehistoric	Unevaluated
32MZ2269	NWNENE Section 31, T151N, R94W	Cairn	Unknown	Unevaluated
32MZ2277	SWNWNE Section 31, T151N, R95W	Cairn	Unknown	Unevaluated
32MZ2278	NENWNE Section 31, T151N, R95W	Cairn	Unknown	Unevaluated
32MZ2377	E½ SE¼ NW¼, W½ SW¼ NE¼ Section 36, T151N, R95W	Cultural Material Scatter, Depression, Dump, Foundation, Machinery	Historic (1955–1965)	Not Eligible
32MZ2382	NWSESE Section 30, T151N, R94W	Cairn	Unknown	Unevaluated
32MZ2390	NESENW, NWSWNE Section 31, T151N, R94W	Cultural Material Scatter	Unknown Prehistoric	Unevaluated
32MZ2393	W½ SE¼ NE¼ Section 25, T151N, R92W	Stone Circle, Other Rock Features	Unknown Prehistoric	Unevaluated
32MZX1175	NWSWNE Section 36, T151N, R95W	Isolated Glass Insulator	Unknown Historic	Not Eligible
32MZX1200	SWSWSE Section 31, T151N, R94W	Isolated Chipped Stone	Unknown Prehistoric	Not Eligible

CONCLUSIONS

On October 1, 2019, SWCA completed an updated Class I cultural resource inventory for the existing TAT-Blue Buttes compressor station in Section 31, T151N, R94W in McKenzie County, North Dakota. The results of the file search are summarized below.

- Twenty-two inventories were previously conducted within the 1-mile study area. The project is fully located within areas covered by three previous cultural resource inventories (manuscript numbers 012811, 012971, and 017485).
- Eleven previously recorded cultural resources are within the 1-mile study area.
- No previously recorded cultural resources occur in the area in which the existing compressor station is located.
- No new disturbance is proposed for the TAT-Blue Buttes compressor station. The area the existing compressor station is located on has been fully surveyed, and no previously recorded sites occur within 75 feet of the existing compressor station. Therefore, SWCA recommends the project be granted a determination of *No Significant Sites Affected* and clearance to proceed as proposed.

Please contact me by email at ssappington@swca.com should you have any further questions or concerns regarding the information assembled during SWCA's Class I cultural resource inventory.

Sincerely,

Sarah Baer Sappington
Principal Investigator
SB/js

Attachment: Figure 1

Contains Privileged Information -- Do Not Release

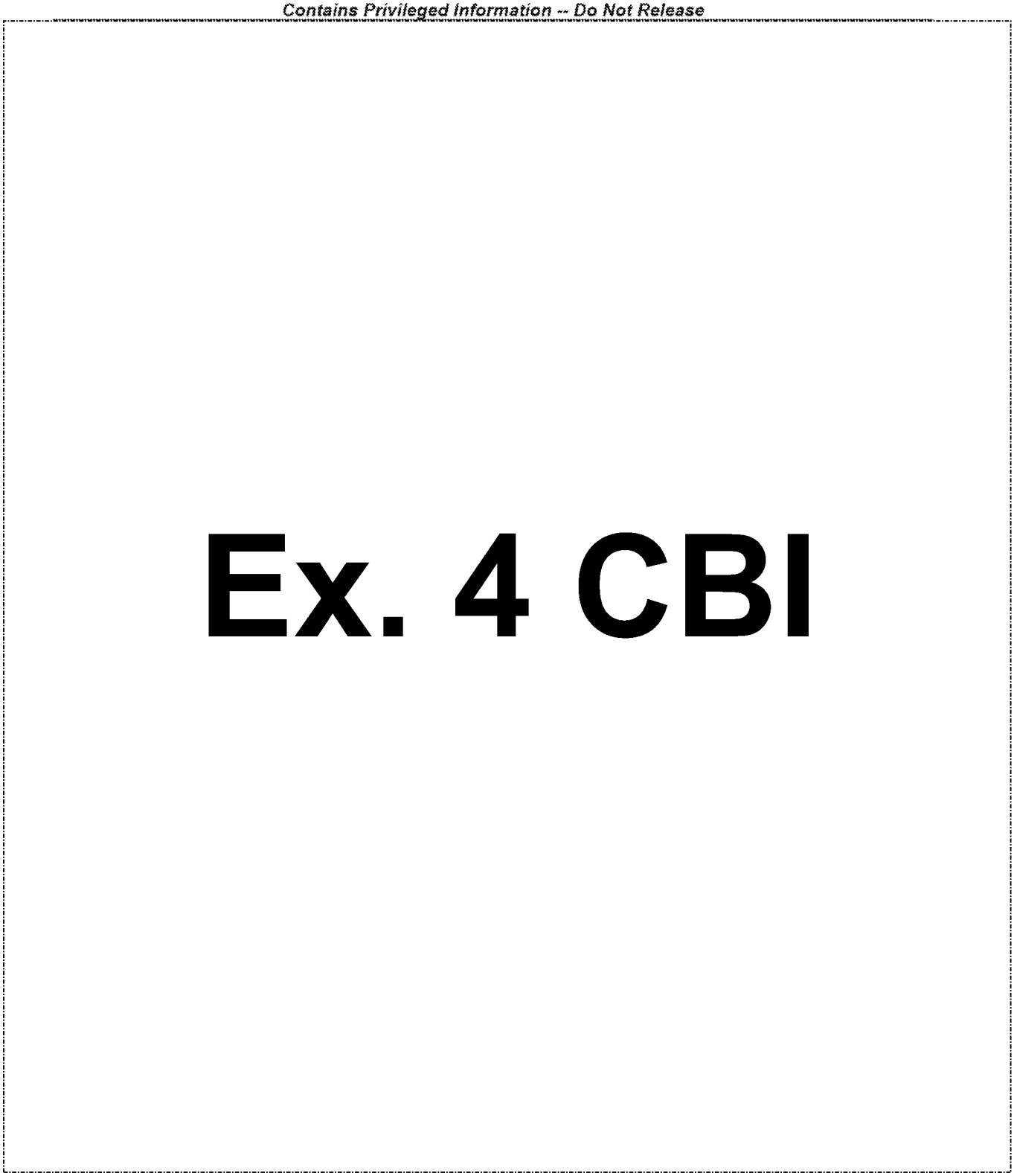

Figure 1. Project location and 1-mile study area surrounding the existing TAT-Blue Buttes compressor station.

SWCA
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Bismarck Office
116 North 4th Street, Suite 200
Bismarck, North Dakota 58501
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www.swca.com

October 9, 2019

Kelsey Gocke
ES&H Environmental Specialist
Targa Resources
811 Louisiana Street, Suite 2100
Houston, Texas 77002

Re: Environmental Review of Additional Compressor at TAT-Blue Buttes Compressor Station, Fort Berthold Indian Reservation

Dear Ms. Gocke:

Targa Resources (Targa) has requested that SWCA Environmental Consultants (SWCA) evaluate potential environmental impacts of the proposed additional compressor at the existing TAT-Blue Buttes compressor station located on fee land owned by the Three Affiliated Tribes (TAT) of the Mandan, Hidatsa, and Arikara Nation (MHA Nation), as well as land owned by individual tribal members, in McKenzie County, North Dakota. In June 2017, SWCA assessed the Blue Buttes compressor station project in *Environmental Review: Targa Corporation: TAT-Blue Buttes Compressor Station, Fort Berthold Indian Reservation.* The U.S. Environmntal Proection Agency (EPA) confirmed the findings of no effects to threatened and endangered species (TES) and no historic properties affected in a letter dated June 30, 2017 (Ref: 8P-AR).

No additional disturbance outside of the existing compressor station would result from addition of the proposed compressor; however, the EPA has requested an updated assessment to determine if there are any new resources present or any impacts beyond those evaluated in the 2017 environmental review. The environmental review below addresses the potential impacts to TES associated with the construction and operation of the newly proposed compressor and related infrastructure. Potential water quality, air quality, and noise impacts are discussed as they relate to TES. The review of historic properties is provided in a separate document.

PROJECT BACKGROUND

Location

The compressor would be located in an existing facility approximately 10 miles southeast of Keene, North Dakota, in the NW¼ NE¼ Section 31, Township 151 North, Range 94 West, McKenzie County, North Dakota (Figure 1). The project is accessed from BIA Road 4 between Highway 22 and Highway 23. Lake Sakakawea is approximately 3.5 miles east of the project area.

Existing Development

The existing TAT-Blue Buttes compressor station was constructed in 2017 and supports the Saddle Butte pipeline system and associated lateral pipelines. For the existing compressor station, approximately 10.10

acres were disturbed for the facilities pad and an additional 0.03 acre was disturbed for the 29-foot-long access road (40-foot right-of-way). The total area of existing disturbance is 10.13 acres (Figure 2).

Proposed Project

The proposed project at the TAT-Blue Buttes compressor station would add one 1,380 horsepower (HP) Waukesha compressor and engine. The site currently has six engines and addition of the proposed compressor would result in seven total Waukesha 1,380 HP engines within the original facility (Figure 3). The project would also add two condensate tanks and one produced water tank, for a total of four condensate tanks and two produced water tanks within the original facility. The best management practices and protective measures described in the 2017 environmental review would appy to this project.

ENVIRONMENTAL REVIEW

SWCA conducted biological resource surveys for the project location on May 16, 2017. The surveys were completed to gather site-specific data for biological, botanical, soil, wetlands, and water resources. Raptor, eagle, and migratory bird habitat surveys were also conducted within a 0.5-mile line-of-sight of the project area.

As described in the 2017 environmental review, soils predominantly consist of Williams-Zahl loams, which have good reclamation potential. Soils have moderate to very high surface runoff and a slight to severe erosion risk, depth to bedrock, and slope. Based on the 2017 survey, the project area is within upland, non-native grassland. Predominant vegetation includes Kentucky bluegrass (*Poa pratensis*), smooth brome (*Bromus inermis*), western snowberry (*Symphoricarpos* spp.), and Canada anemone (*Anemone canadensis*) with some native and non-native forbs intermixed. There are four small emergent wetlands approximately 400 feet southeast of the compressor station. The proposed project would not disturb soils, vegetation, or wetlands.

Water

The TAT-Blue Buttes compressor station is in the Clarks Creek subwatershed (hydrologic unit code 101101011904). Runoff from the compressor station project area flows overland to the north and enters a draw approximately 0.2 mile from the compressor station, where the surface water runoff then flows approximately 5.1 river miles to Bear Den Creek at a point approximately 3.8 river miles upstream of Lake Sakakawea.

The proposed project would not disturb any additional soil; therefore, there is little risk to surface water quality as a result of soil erosion and stormwater runoff in the project area. The project would add two new condensate tanks and one produced water tank. Implementation of the proposed project could result in project-related spills of fuel or other hazardous chemicals and therefore degradation of water quality. As with the 2017 environmental review, the potential for surface water impacts from project-related spills has been reduced through project siting and implementation of Targa's best management practices and spill prevention measures. The compressor station is located away from wooded draws, perennial streams, and Lake Sakakawea which reduces the potential for project-related spills to reach surface water resources.

Noise

The existing compressor station is located in a predominantly rural setting with associated low levels of ambient noise and few artificial light sources. The primary sources of human-made ambient noise and light emissions are vehicular traffic, agricultural activity, and activities associated with oil and gas

development. According to the 2017 environmental review, compressor noise is expected to be less than 55 dBA at 0.25 mile from the noise source. Protective measures described in the 2017 environmental review apply to this project. Suitable mufflers would be installed on all internal combustion engines and certain compressor components to minimize noise levels. The compressor station is remotely monitored 24 hours a day, 7 days a week via supervisory control and data acquisition systems to reduce noise and traffic and to increase safety. There is unlikely to be a change in noise levels compared to the existing compressor station.

Air Quality

As described in the 2017 environmental review, the compressor station is not located in a nonattainment or maintenance area. The primary criteria pollutants from natural gas-fired reciprocating engines are nitrogen oxides, carbon monoxide, and volatile organic compounds. The 2017 environmental review concluded that, because of the relatively small amount of emissions that a single compressor station would have, as well as the distance of this station from existing sensitive receptors, the TAT-Blue Buttes compressor station would have little to no impact on public health and safety and would cause no violations of any National Ambient Air Quality Standards.

This project would add one 1,380 HP Waukesha compressor and engine at the TAT-Blue Buttes compressor station. The site currently has six engines and the addition of the proposed compressor would result in seven 1,380 HP Waukesha engines at the compressor station. The additional engine would result in a 16.5% increase in site compression and emissions. The additional compressor would also increase fugitive emissions. Vehicles used for transportation of workers, materials, and equipment can emit pollutants directly and by disturbing dust on paved or unpaved roadways.

Threatened and Endangered Species

The U.S. Fish and Wildlife Service Information, Planning, and Consultation System (2019) lists seven species listed under the Endangered Species Act (ESA) that could occur in the project vicinity: whooping crane (*Grus americana*), piping plover (*Charadrius melodus*) and its designated critical habitat, interior least tern (*Sterna antillarum*), rufa red knot (*Calidris canutus rufa*), pallid sturgeon (*Scaphirhynchus albus*), Dakota skipper (*Hesperia dacotae*) and its designated critical habitat, and northern long-eared bat (*Myotis septentrionalis*). These species were evaluated in the 2017 environmental review. The review concluded there would be no adverse effects to these species or their habitat.

No species have been newly listed since 2017 and no critical habitat has been newly designated. No habitat for any of the species listed above would be removed as part of this project. There would be no impacts to wetlands or water resources that could affect whooping crane, piping plover, least tern, rufa red knot, or pallid sturgeon. Noise and fugitive dust from construction would be minimal and temporary. The additional noise and emissions from operation of the new compressor would not be significant. Therefore, no adverse effects are anticipated to threatened or endangered species.

Other Protected Species

The Bald and Golden Eagle Protection Act (BGEPA) (16 United States Code 668–668d, 54 Sta. 250) and the Migratory Bird Treaty Act of 1918 (MBTA) (916 United States Code 703–711) protect bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) and their nests, and nesting migratory bird species and their active nests (i.e., nests containing eggs or young), respectively. Surveys for species protected under the BGEPA and MBTA were conducted in May 2017. No eagle nests or other raptor nests were observed within 0.5 mile of the project area. The closest known bald eagle nest is 2 miles northeast of the project area and the closest known golden eagle nest is 5 miles southeast of the project

area. The 2017 environmental review concluded that the project would not result in unauthorized incidental take of eagles.

Suitable habitat for migratory grassland birds surrounds the project area; however, no habitat would be removed for this project. If construction of the new compressor occurs during breeding season (February 1–July 15), migratory birds in the surrounding habitat could be disrupted by project activity. There would be no impacts to water resources that could affect waterfowl or shorebirds. The additional noise and emissions from the new compressor would not be significant. Therefore, there would be no unauthorized incidental take of eagles, raptors, or other migratory birds as a result of the proposed project.

CONCLUSION

The new compressor, three tanks, and fugitive components would all be located within the existing TAT-Blue Buttes compressor station constructed in 2017. The environmental conditions in the project area have not changed since the 2017 field surveys and environmental review. No species have been newly listed as threatened or endangered and no critical habitat has been newly designated. There would be no impacts to water resources that could affect TES or migratory birds. The additional noise and emissions from the new compressor engine would not be significant and would not affect TES.

As part of the Federal Implementation Plan for True Minor Sources in Indian Country, EPA must confirm that Targa has satisfactorily addressed the procedures to address TES for this project. Targa can submit this review to the EPA to show compliance with the ESA. Should you have any questions regarding this environmental review, please contact me by telephone at 701.258.6622 or by email at jschleicher@swca.com.

Sincerely,

Jolene R. Schleicher

Jolene Schleicher
Project Manager

Attachments: Figures 1 through 3

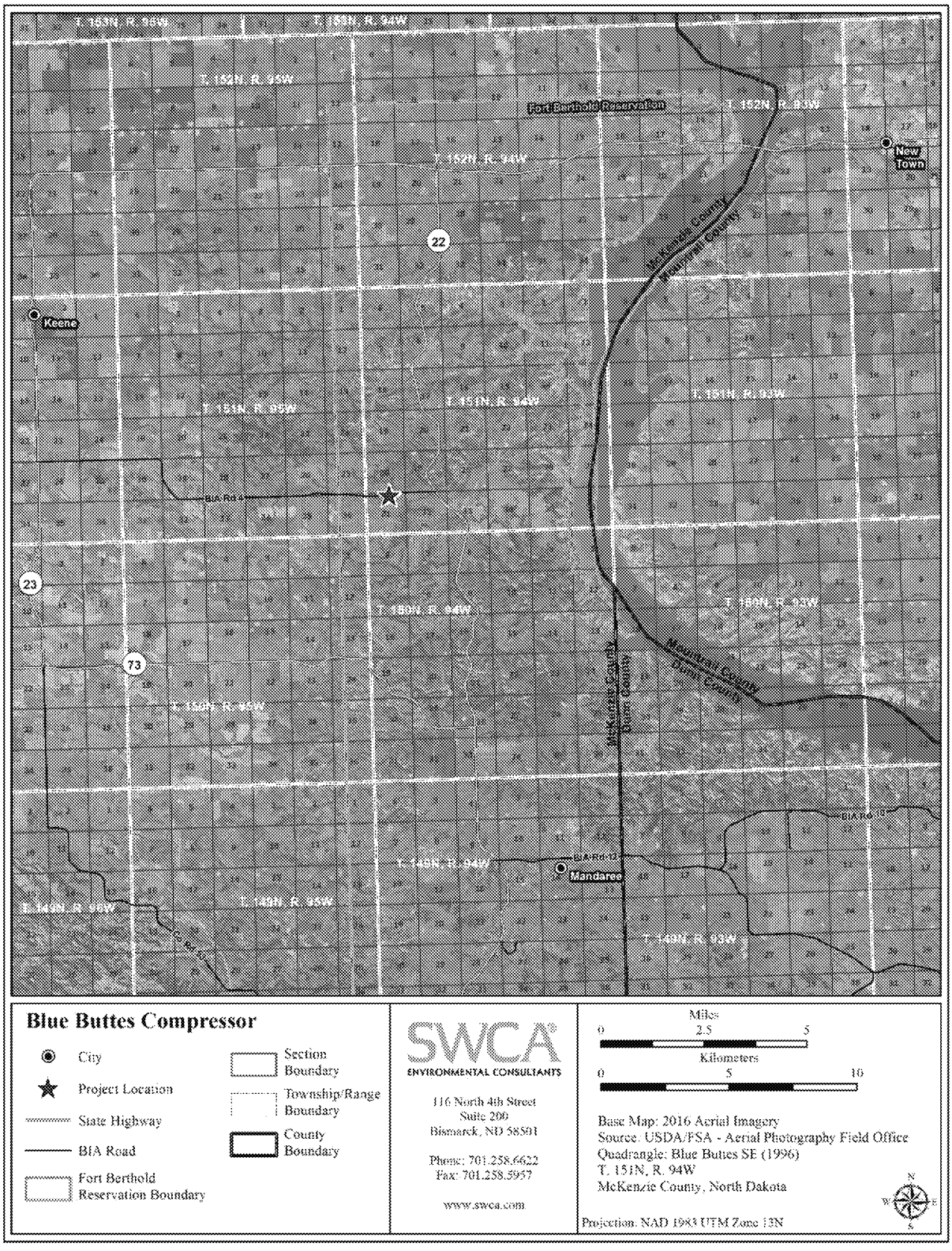

Figure 1. Project location on the Fort Berthold Indian Reservation.

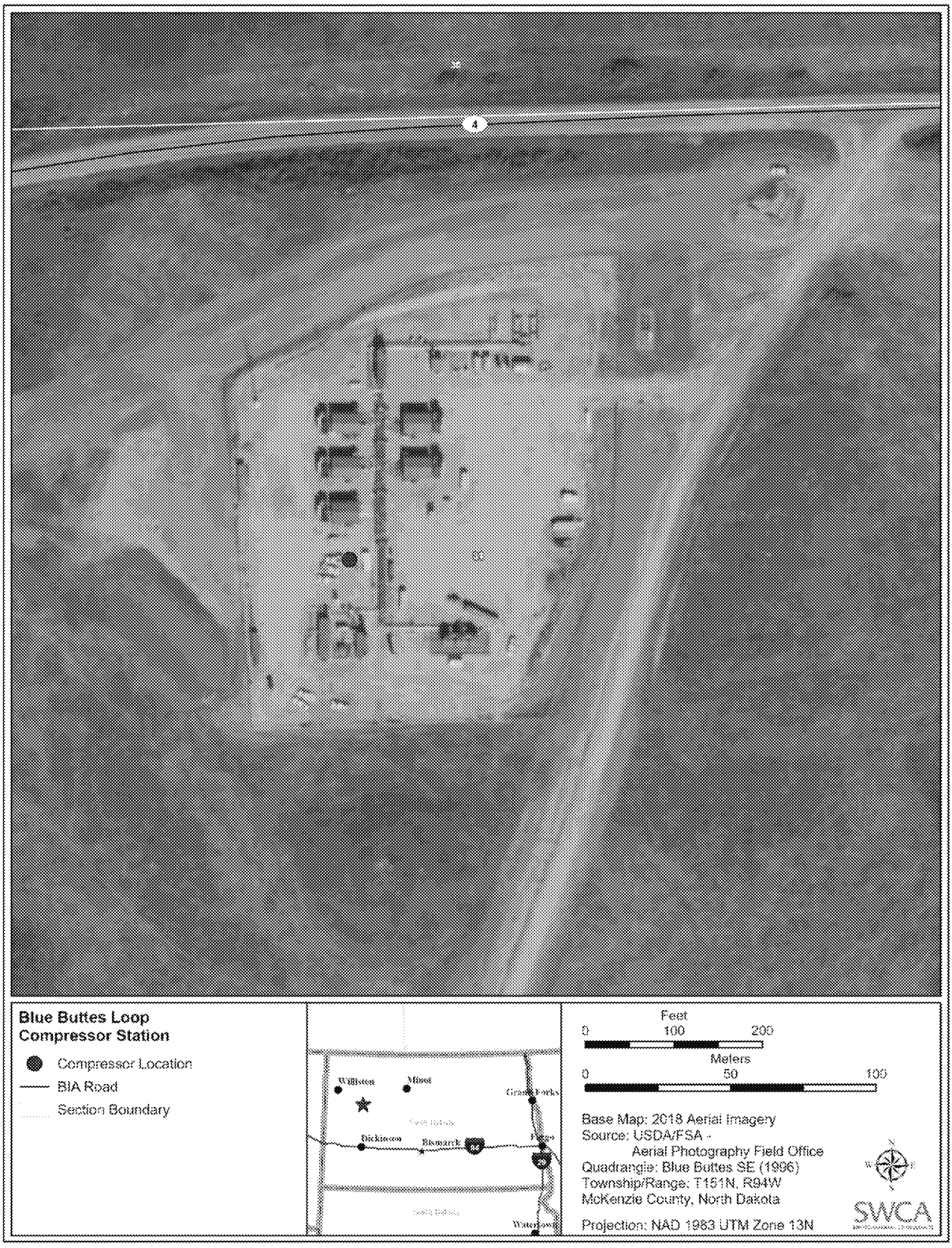

Figure 2. New compressor location within existing TAT-Blue Buttes compressor station.

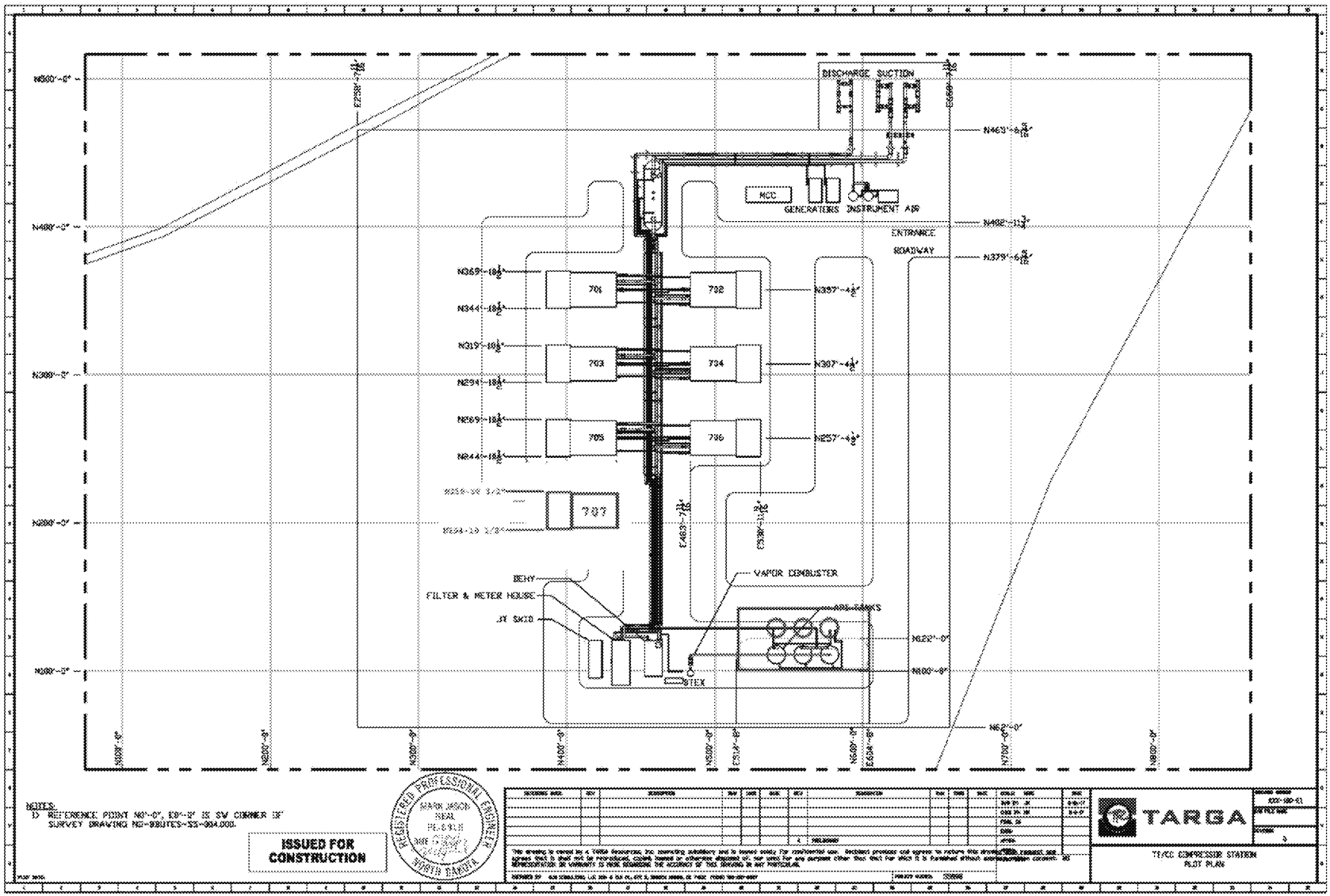

Figure 3. New compressor and tanks within the existing TAT-Blue Buttes compressor station.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
1595 Wynkoop Street
Denver, CO 80202-1129
Phone 800-227-8917
www.epa.gov/region8

Ref: 8P-AR

Ms. Catherine Schroder
Senior Environmental Specialist
Targa Badlands LLC
1000 Louisiana, Suite 4300
Houston, Texas 77002

JUN 30 2017

Dear Ms. Schroder:

Thank you for your submittal dated June 30, 2017, transmitting documentation of your procedures to address threatened and endangered species (TES) and historic properties for the TAT-Blue Buttes Compressor Station under the Federal Implementation Plan for True Minor Sources in Indian Country in the Oil and Natural Gas Production and Natural Gas Processing Segments of the Oil and Natural Gas Sector. In accordance with 40 CFR 49.104(a)(2), you must obtain written confirmation from the U.S. Environmental Protection Agency that you have satisfactorily addressed the procedures before submitting the Part 1 General Facility Information registration form 30 days prior to beginning construction.

This letter serves as written confirmation that Targa Badlands LLC has satisfactorily completed the procedures to address TES and historic properties for the above mentioned true minor new source with documentation supporting your findings of no effects to TES and no historic properties affected. Please be aware that since you submitted the Part 1 General Facility Information registration form at the same time as the documentation of procedures to address TES and historic properties, construction may not begin on this source until 30 days after you receive this letter.

If you have any questions or concerns, please contact Ms. Claudia Smith of my staff at (303) 312-6043 or smith.claudia@epa.gov.

Sincerely,

for

Monica S. Morales, Director
Air Program

cc: Edmund Baker
Environmental Director, Three Affiliated Tribes

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Environmental Review: Targa Corporation: TAT Blue Buttes Compressor Station, Fort Berthold Indian Reservation

Prepared for

Three Affiliated Tribes of the Mandan, Hidatsa, and Arikara Nation (MHA Nation)

Prepared by

SWCA Environmental Consultants

June 2017

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1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 Introduction

The proposed project would construct the TAT Blue Buttes Compressor Station (compressor station) and associated short access road. The station would support the existing Saddle Butte Pipeline system and associated lateral pipelines on the Fort Berthold Indian Reservation (FBIR) by compressing natural gas. The station would subsequently facilitate the transport of increasing natural gas liquids to market. This development has been proposed on fee land owned by the Three Affiliated Tribes (TAT) of the Mandan, Hidatsa, and Arikara Nation (MHA Nation), as well as those of individual tribal members, in McKenzie County, North Dakota. This environmental review addresses the potential impacts associated with the construction and operation of the proposed compressor station related infrastructure.

1.1.1 Location

The proposed project consists of one compressor station and short access road located within the Reservation, as illustrated in Figure 1.1.

The station would be located approximately 9.8 straight-line miles southeast of Keene, North Dakota, in the NW ¼ NE ¼, Section 31, Township (T) 151 North (N), and Range (R) 94 West (W) in McKenzie County, North Dakota (Figure 1.2). An additional new access road 29 feet in length (0.03 acre) with a 40-foot right-of-way (ROW) would be constructed from an existing access road to the station (see Figure 1.2)

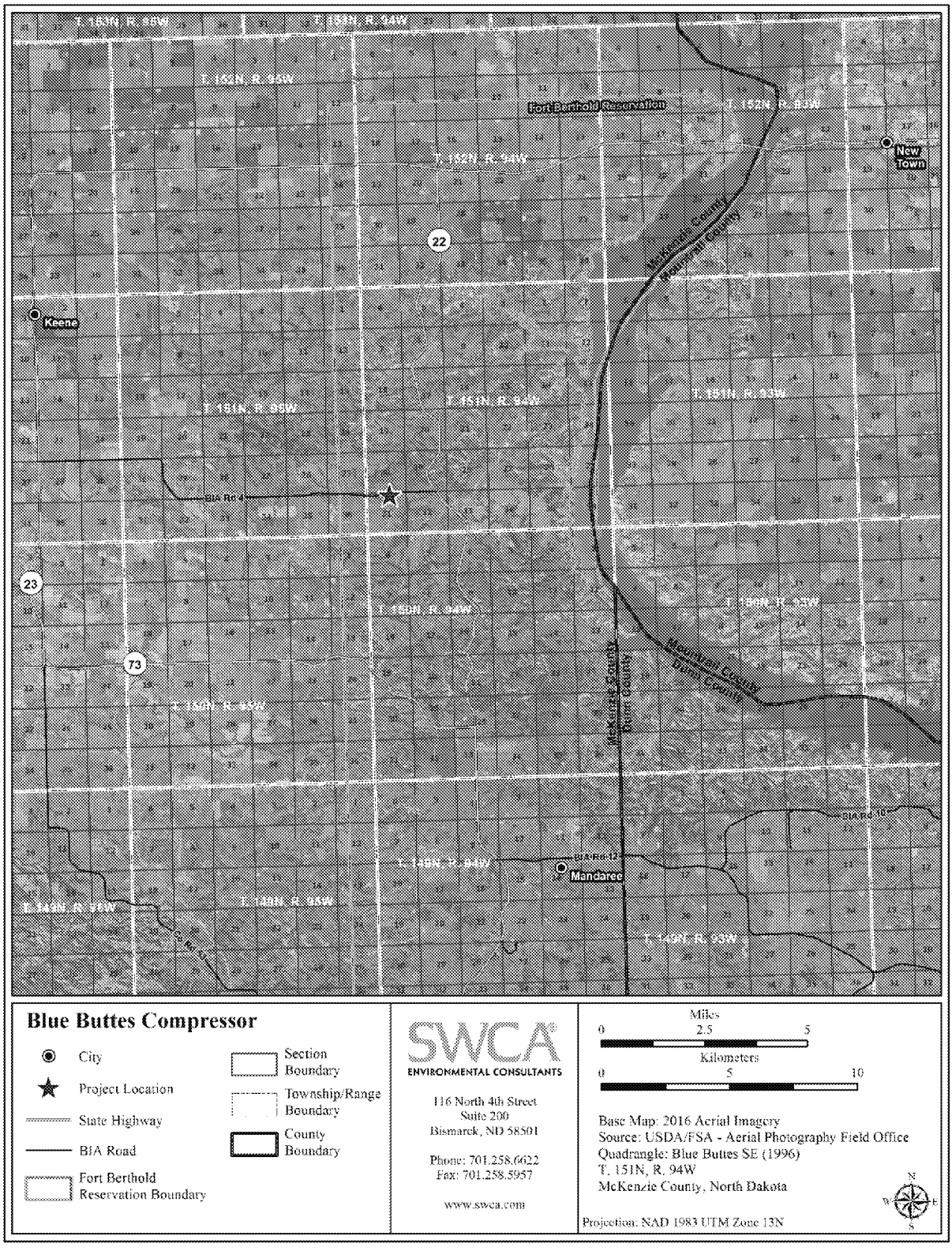

Figure 1.1. Proposed project location in the Fort Berthold Indian Reservation.

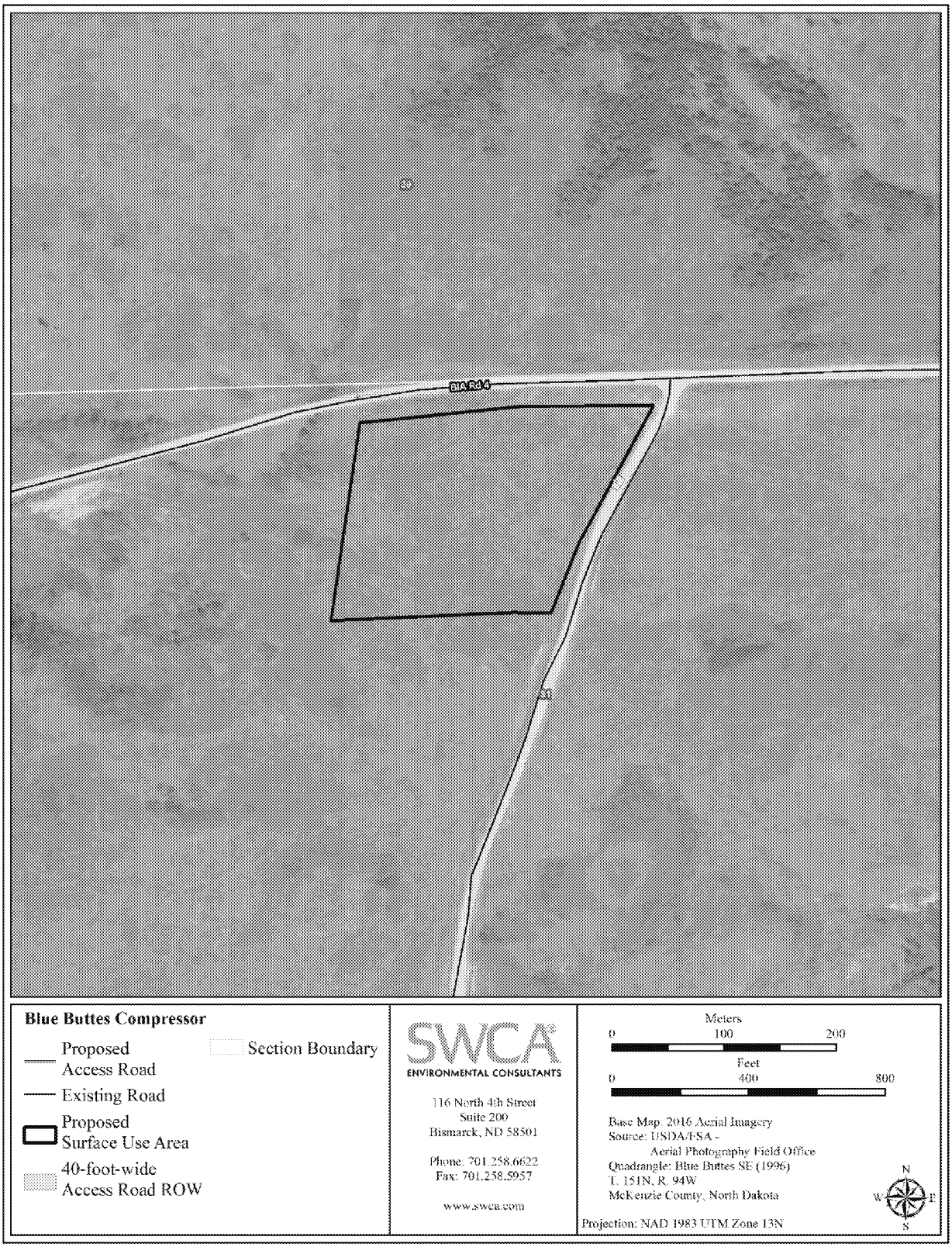

Figure 1.2. Project location for the proposed TAT Blue Buttes Compressor Station and access road NW¼ NE¼ Section 31, T151N, R94W.

1.2 Authority for the Proposed Project

The TAT as the owner of the fee lands located on the FBIR has authority over the proposed project.

1.3 Purpose and Need

The purpose and need for the proposed project is to facilitate the transport of increasing natural gas liquids and crude oil volumes to market.

1.4 Decision to be Made

The TAT will decide whether to authorize the proposed project and grant Targa Corporation (Targa) an easement to construct the compressor station and associated access road.

2.0 PROPOSED PROJECT

Targa is proposing to construct a reciprocating piston compressor station and associated short access road located on TAT FBIR fee lands in McKenzie County North Dakota. A compressor station is a facility that helps the transportation process of natural gas from one location to another. Natural gas, while being transported through a gas pipeline, needs to be constantly pressurized in certain distance intervals. The compressor station compresses the natural gas, thereby providing energy to move the gas through the pipeline. The gas in compressor stations is pressurized by special turbines, motors, and engines and are typically installed very 40 to 70 miles along a pipeline route. Compressor stations may emit methane, ethane, benzene, and other gases

2.1 Proposed Project

The proposed action would construct the compressor station and associated short access road on the FBIR. The station would support the existing Saddle Butte Pipeline system, specifically the Blue Butte Loop (Bureau of Indian Affairs [BIA] 2017), also located on the FBIR that was analyzed by the BIA in a Categorical Exclusion prepared in compliance with the National Environmental Policy Act (NEPA).

Preconstruction planning activities were conducted by Targa, a civil engineer, and SWCA Environmental Consultants (SWCA) to select the compressor station location and access road route that would avoid and minimize impacts to resources. This process included a landscape analysis, field surveys, and on-site ROW inspections, as described below.

During project planning, Targa used a landscape analysis to site its compressor station and access road in locations that would avoid sensitive resources. This included a review of the existing analyses for the Blue Butte Loop Pipeline and the Saddle Butte Pipeline, LLC, Red Tipped Arrow 33-11H Well Site to Bear Paw Energy Connection (BIA 2010). Additionally, project planning looked at potential visual impairments, topographic suitability for construction, presence of wetlands, distance to Lake Sakakawea, location of perennial or intermittent waterbodies, presence of designated critical habitat or historical use by federally protected species, and avoidance of previously recorded cultural resource sites. Project siting locations that could negatively affect any of these resources were dismissed from further consideration.

Cultural and biological resource surveys were conducted for the project location on May 16, 2017, by SWCA. The surveys were completed to gather site-specific data and photographs for cultural, biological, botanical, soil, wetlands, and water resources. Raptor, eagle, and migratory bird habitat surveys were also conducted within a 0.5-mile line-of-sight of the project area. As necessary, project infrastructure design was rerouted to avoid affecting sensitive resources. Results of these surveys are provided in Sections 3.1, 3.2, 3.4, and 3.5.

Preconstruction on-site inspections by Darryl Sayler of Targa, SWCA, and tribal representatives—Destiny Fox Deane, TAT Fish and Wildlife; Travis Hallam, Tribal Pipeline Authority; and Paul Grady, TAT Environmental Division of the Natural Resources Department—occurred on May 24, 2017. During the on-site inspections, the proposed project siting and infrastructure and results of desktop analysis and resource surveys were reviewed, discussed, and finalized. Site topography, potential drainage issues, and erosion-control measures associated with compressor station and

access road alignment were discussed in order to minimize project effects to natural and cultural resources. Avoidance measures and other protective measures were incorporated into the final project design to minimize or mitigate impacts to evaluated resources, as shown in Section 2.1.2.

2.1.1 Detailed Project Description

2.1.1.1 Compressor Station

The compressor station would be designed to accommodate construction and placement of the reciprocating piston compression station unit and ancillary facilities. The proposed compressor station construction area is 10.10 acres. An additional 0.03 acre would be disturbed for the 29-foot-long access road (40-foot ROW). The total area of disturbance would be 10.13 acres. Once construction is completed (Table 2.1).

Table 2.1. Proposed Blue Butte Compressor Station and Access Road Disturbance Area

Project Component	Long-Term Disturbance (acres)
Compressor station	10.10
Access road and utility corridor (29 feet long)	0.03
Total Disturbance	**10.13**

* Project Construction and Operation

Construction of the compressor station and access road would occur over 2- to 3-week period followed by interim reclamation and operation.

2.1.1.2 Location Preparation

Field Camps

A few personnel (1–5 people) may be housed in self-contained trailers for a short period; long-term housing is not proposed. Most personnel would commute to the site. Human waste would be collected on-site in portable toilets and trailers and would be transported off-site to a state-approved wastewater treatment facility. All other solid waste would be stored in enclosed containers to be transported to and disposed of at state-approved facilities.

Compression Station Construction

Compression station construction would involve long-term surface disturbance. This would include construction of the compressor station, including cut-and-fill slopes as well as stockpiling of topsoil on the edge of the foundation for the structure surrounding the compressor station, compressor station and the access road.

Construction of the compressor station would take approximately 10 days and would be completed using standard heavy equipment, such as earth-moving equipment and bulldozers. The foundation would be leveled by balancing cut-and-fill areas. Vegetation would be cleared from the site, and topsoil would be stripped and stockpiled on-site for future reclamation. Excavated subsoil stored on-site would be used in the construction of the foundation, which would be graded to drain water

away from the project site. BMPs would be implemented to minimize wind and water erosion of the topsoil. BMPs may include water bars, silt fences, erosion mats, and biologs. Berms would be constructed around the site to prevent runoff.

Access Road Construction

Targa designed its proposed access road and utility corridor to use existing roads and previous disturbances to the greatest extent practicable. The proposed access road for the compression station would extend approximately 29 feet northwest from an existing unnamed road to the proposed compression station location, as shown in Figure 1.2. The proposed access road and utility corridor ROW is 40 feet wide, which allows for construction of ditches that can accommodate large volumes of snow and runoff and which is consistent with county and township roads in North Dakota. The access road would be approximately 29 feet of new or upgraded/improved road on tribal land. The road and utility corridor ROW would result in approximately 0.03 acre of long-term disturbance (see Figure 1.2, Table 2.1).

Because of the short length of the access road, its construction would take approximately 2 days and would be completed using standard heavy equipment, such as earth-moving machinery and bulldozers. Construction would follow the road design standards outlined in the Bureau of Land Management (BLM) Gold Book (BLM and U.S. Forest Service 2007). A minimum of 6 inches of topsoil would be stripped from the proposed access road route to provide access to the subsoil, which is better suited for shaping and compaction. The topsoil would be temporarily stored along the sides of the road and subsequently spread on the back slopes in preparation for seeding during interim reclamation. The access road would be crowned and ditched with water turnouts to ensure proper drainage and direct runoff away from gravel surfaces. The access road would be surfaced with a minimum of 4 inches of aggregate before the start of drilling operations, and would remain in use for the life of the wells. Water control features would be constructed to control erosion. A diagram of typical road cross sections is provided as Figure 2.1.

All disturbed areas except the road surface would be seeded and stabilized as soon as practical following construction. Measures for erosion and sedimentation control would be implemented in the project area; these measures could include installing culverts with energy-dissipating devices at culvert outlets to avoid sedimentation in ditches, constructing water bars alongside slopes, and planting cover crops to stabilize soil following construction and before permanent seeding.

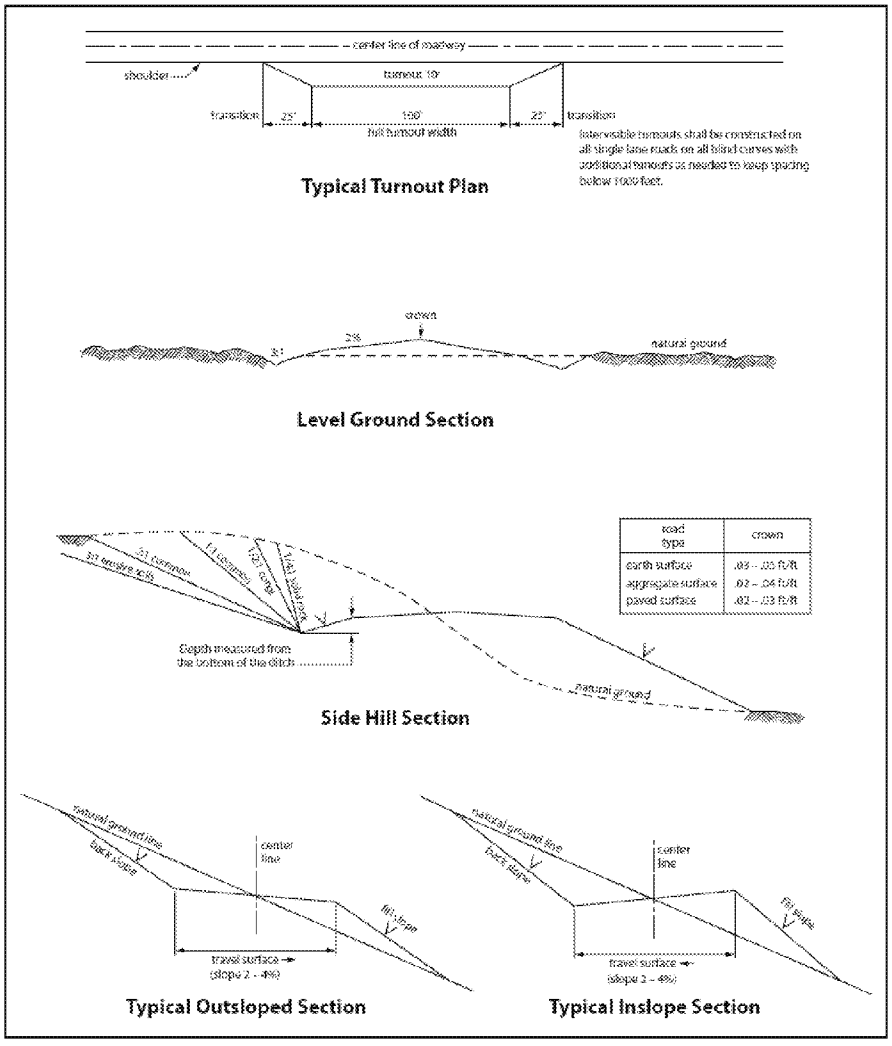

Figure 2.1. Typical road cross sections (BLM and U.S. Forest Service 2007).

2.1.1.3 Interim Reclamation

Interim reclamation would consist of reclaiming all areas not needed for the compressor station and access road. Immediately after construction is completed, all equipment and materials not necessary for operations would be removed from the project location and surrounding area. The compressor station area of disturbance not needed for the compressor station facility would be would be recontoured, covered with 6 inches of topsoil, and seeded using methods and seed mixtures determined by TAT. Erosion- and sediment-control measures would be repaired or reinstalled, as needed.

The working area of the compressor station and the running surface of the access road would be surfaced with scoria or crushed rock obtained from a previously approved location. The out-slope portions of the road would be covered with stockpiled topsoil and seeded with a seed mixture determined by TAT. Targa would use approved chemical or mechanical methods to control noxious weeds within the ROW, compressor station, or other applicable facility areas.

All topsoil material stockpiled after construction and following interim reclamation would be immediately placed in windrows no taller than 2 to 4 feet, seeded with a certified weed-free mixture as recommended by TAT at a rate of 10 pounds per acre, and covered with fiber matting to prevent erosion and maintain soil fertility. At least two growing seasons are typically required for vegetation to sufficiently repopulate reclaimed areas. If vegetation reclamation were to prove unsuccessful, additional measures could be required and developed by Targa and TAT.

2.1.1.4 Long-Term Operation and Maintenance

The duration of the compressor station operation cannot be reliably predicted since it is an integral part of the pipeline system serving wells in this area. On average, Targa estimates most the compressor station would be in operation for 30 years. During long-term operation of the compressor station wells, underground electricity would supply the power for facilities.

Power Supply

Targa proposes installing a generator to supply power to the compressor station.

2.1.1.5 Final Reclamation

Final reclamation would occur upon final abandonment of commercial operations for the pipeline system. During this process, all facilities would be removed and reused to the extent feasible for future development projects. Pipelines in the access road ROW would be purged and remain buried in the ROW. Buried electric lines would also remain in the ROW. Access roads and work areas would be leveled or backfilled, scarified, recontoured, and seeded. Exceptions to these reclamation measures might occur if TAT approves assignment of an access road to concurring landowners.

2.1.1.6 Vehicle Traffic

Various levels of vehicle traffic would be generated during the construction phase and operation phase. Construction trips would require large trucks to haul equipment (e.g., bulldozers, scrapers, graders, etc.) and supplies to and from the site, hauling trucks to deliver other construction materials and vans and other crew vehicles. Operation of the compressor station would be conducted remotely. However, it is anticipated that regularly occurring maintenance vehicles would travel to and from the compressor station.

2.1.2 Applicant-Committed Best Management Practices, Protective Measures, and Mitigation Measures

2.1.2.1 Best Management Practices

The following are examples of general best management practices (BMPs). Targa would implement these and other BMPs to the extent that they would be technically feasible and would add strategic and measurable protection to the project area.

- Plan roads and facility sites to minimize visual impacts.
- Use existing roads to the extent possible, upgrading them as needed.

- Reduce the size of facility sites and types of roads to minimize surface disturbance.
- Minimize topsoil removal.
- Stockpile stripped topsoil and protect it from erosion until reclamation activities begin. At that time, redistribute the soil and seed the disturbed areas. Protect and maintain these reclaimed areas until they are fully stabilized.
- Avoid removal of or damage to trees, shrubs, and groundcover where possible. Clearly mark trees near construction areas to prevent their removal.
- Mow instead of clear a facility or well site to accommodate vehicles or equipment.
- Maintain buffer strips or use other sediment-control measures to avoid sediment migration to stream channels as a result of construction activities.
- Plan for erosion control.
- Ensure proper storage of chemicals (including secondary containment).
- Keep sites clean. For example, contain trash in a portable trash cage that would be emptied at a state-approved sanitary landfill.
- Conduct snow removal activities in a manner that would not adversely affect reclaimed areas and areas adjacent to reclaimed areas.
- Avoid or minimize topographic alterations, activities on steep slopes, and disturbances in stream channels and floodplains to the extent possible.
- Maintain buffers around work areas where construction activities could pose a risk for fire.
- Limit idling of vehicles.
- Use cleaner diesel engines.
- Keep fire extinguishers in all vehicles.
- Plan transportation to reduce vehicle density.
- Post speed limits on roads.
- Avoid travel during wet conditions, which could result in excessive rutting.
- Paint facilities a color that would blend with the environment.
- Practice dust abatement on roads and during compressor station construction.
- Recontour disturbed areas to approximate the original contours of the landscape during final reclamation.
- Develop a final reclamation plan that would allow disturbed areas to be quickly absorbed into the natural landscape.
- Follow any disturbance from operational maintenance actions along gathering pipelines by reclamation.

Targa recognizes that several BMPs can be used to mitigate environmental concerns specific to projects associated with belowground linear alignments such as the utility corridor proposed for this project. These include the following:

- Follow the contour (form and line) of the landscape.
- Avoid locating ROWs on steep slopes.
- Share common ROWs.
- Collocate multiple lines in the same trench.
- Use natural features (topography, vegetation) or artificial features (berms) to help screen facilities such as valves and metering stations.

2.1.2.2 Protective Measures

Dust Control

- During construction, a watering truck would be kept on-site, and the access road would be watered, especially during periods of high winds or low precipitation.

Spill Prevention

- Gathering pipeline design and safety measures would be implemented to maintain the integrity of the gathering pipelines and prevent pipeline failures or erosion. Check and manual shutoff valves would be installed at the connection between the trunk and gathering lines. Additionally, Targa's spill prevention plan would be strictly adhered to, and a spill prevention, control, and countermeasure plan would be implemented.

Soils and Erosion Control

- Topsoil would be placed to divert flow away from the compressor station to limit the possibility of surface contamination.
- All disturbed areas not needed for operations after completion of construction and drilling would be revegetated.
- Matting would be laid and/or hydroseeding would take place on the exposed slopes of the construction site, as specified by the TAT.
- If trees and other woody material are removed from the proposed compressor station area, they would be ground and added to the topsoil.
- All topsoil material stockpiled after construction and following interim reclamation would be immediately placed in windrows no higher than 2 to 4 feet, seeded with a certified weed-free mixture at a rate of 10 pounds per acre, and covered with fiber matting to prevent erosion and maintain soil fertility.
- The project location would be inspected during construction in accordance with National Pollutant Discharge Elimination System (NPDES) requirements, and the location would be monitored after construction to prevent erosion.
- Excess soil after interim rehabilitation would be removed from the project area and disposed of in accordance with appropriate permits.

Cultural and Paleontological Resources

- Targa would avoid sites eligible or unevaluated for eligibility for the National Register of Historic Places (NRHP) by a 75-foot buffer (or other Tribal Historic Preservation Officer [THPO]/proponent agreed-upon distance) based on the boundary mapped during the Class III cultural resources inventory. These locations and the avoidance buffers would be clearly marked on all project maps. Corresponding geographic information system (GIS) layers would be loaded on all global positioning system (GPS) units.
- Targa would avoid known paleontological localities by a 75-foot buffer (or other BIA/proponent agreed-upon distance). These locations and the avoidance buffers would be clearly marked on all project maps and GIS layers loaded on all GPS units.

Visual Resources

- Roads and facility sites would be planned to minimize visual impacts.
- Facilities would be painted a color that would blend with the environment (shale green).
- The proposed project would develop a final reclamation plan that would allow quick absorption of disturbed areas into the natural landscape.

Ecosystems and Habitats

- Cut-and-fill slopes would be seeded with a certified weed-free mixture at a rate of 10 pounds per acre and covered with fiber matting to prevent erosion and maintain soil fertility.
- Construction equipment, materials, and vehicles would be stored at construction sites or at specified construction yards. This would help keep vehicles from tracking invasive seeds and vegetation onto undisturbed areas. It would also help prevent wildlife from getting into or under equipment.
- All personal vehicles, sanitary facilities, and staging areas would be confined to a limited number of specified locations to decrease chances of incidental disturbance and spread of weeds.
- In areas with existing noxious weed infestations, vegetation, soils, and trench spoil material would be stockpiled adjacent to its removal point and, following construction, would be returned to its original location to prevent spreading.
- Prompt re-establishment of the desired vegetation in disturbed areas would be required. Seeding would occur during the frost-free periods following construction. Certified "noxious weed-free" native grass seed would be used on all areas to be seeded.

Wildlife

- Structures and ancillary facilities would be sited a minimum of 150 feet from wetlands and perennial and intermittent streams and would also have a 24-inch-tall perimeter berm.

- Targa would schedule construction for late summer or fall/early winter to avoid disrupting waterfowl or other migratory birds during the breeding season (February 1–July 15).
- If the construction time frame in the item above cannot be met, Targa would degrade migratory bird habitat in the project area outside of the breeding season by mowing or clearing and grubbing to discourage nesting, and would maintain the habitat in a degraded state until construction is completed.
- If construction occurs within the migratory bird nesting season (February 1–July 15) without habitat degradation, Targa would conduct surveys at the compressor station location for migratory birds and their active nests (nests containing eggs or young) within 5 days of commencement of construction activities. If active migratory bird nests are found during surveys, the U.S. Fish and Wildlife Service (USFWS) would be presented with a proposal for realigning the work or maintaining adequate buffers to prevent the take of migratory birds.
- Targa would maintain a minimum 0.5-mile buffer around all known or newly discovered active bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*) nests.
- If utility lines are needed, underground utility lines would be used at the project location. The compressor station would be located over or near areas with existing disturbances.
- Covers would be installed under drip buckets and spigots.
- Interim reclamation would be conducted on at least one-half of the disturbed area.

Noise

- Suitable mufflers would be installed on all internal combustion engines and certain compressor components to minimize noise levels.
- The compressor station would be monitored 24 hours a day, 7 days a week remotely via supervisory control and data acquisition (SCADA) systems to reduce noise and traffic and to increase safety.

Safety

Targa would implement fire prevention and control measures, including the following:

- Requiring construction crews to carry fire extinguishers in their vehicles and equipment.
- Training construction crews in the proper use of fire extinguishers.
- Contracting with the local fire district to provide fire protection.

Socioeconomics

- Targa would comply with all Tribal Employment Rights Office (TERO) requirements.

Traffic

- Construction personnel would stay within the ROW or would follow designated access roads.

2.1.2.3 Mitigation Measures

- If a whooping crane (*Grus americana*) is sighted within 1 mile of the proposed project area, work would stop, and the USFWS would be notified. In coordination with the USFWS, Targa could resume work after the bird(s) leaves the area.
- If cultural resources are discovered during construction or operation, the operator would immediately stop work, secure the affected site, and notify the BIA and MHA Nation THPO. Unexpected or inadvertent discoveries of cultural resources or human remains trigger mandatory federal procedures that include work stoppage and THOP consultation with all appropriate parties. Following any such discovery, operations would not resume without written authorization from the THPO. Project personnel would be prohibited from collecting any artifacts or disturbing cultural resources in the area under any circumstance. Workers who step outside the ROW would be considered trespassers.

3.0 THE AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter includes a brief description of the environment that would likely be affected by the proposed project. The description of the affected environment is limited to the information that is relevant to understanding the potential impacts of the project. Certain resources were considered but were not carried forward for further analysis because they are not present or would not be affected. These are wilderness, land use plans, and timber harvesting.

The analysis of effects takes into consideration project design elements and applicant-committed BMPs and measures, described in Chapter 2, to minimize the impacts. Any unavoidable impacts may require additional mitigation.

3.1 Land Resources

3.1.1 Topography

The analysis area for topography resources is the 10.13-acre project area.

3.1.1.1 Affected Environment

The project area is located in southwestern North Dakota. Southwestern North Dakota is part of the relatively flat Great Plains, which slope gently upward toward the Rocky Mountains. The land surface in southwestern North Dakota consists of hilly to gently rolling plains with occasional buttes. The surface, including the North Dakota Badlands, has local relief shaped by erosion of 300 to 500 feet. The Missouri Coteau is a 30- to 70-mile-wide strip extending diagonally from the northwest corner of the state to the south-central border and marks the farthest advance of glacial ice. The local relief is primarily used as rangeland.

3.1.1.2 Environmental Consequences

Although some ground surface disturbance would occur and a compressor station would be constructed, no changes to the existing topography are planned as part of the proposed project. The existing hills would not be disturbed or graded. Therefore, no effects to topography would occur as a result of the proposed project.

3.1.2 Soils

The analysis area for soil resources is the 10.13-acre project area.

3.1.2.1 Affected Environment

The project area consists of till plains and shallow upland soils developed from a variety of landforms, including rolling plains and rises (6%–9% slopes) to steeper hill slopes and ridges (6%–35% slopes). Soil textures are primarily silt and clayey loams to loams in soils derived from residuum weathered from sedimentary rock and glacial deposits of fine-loamy till (Natural Resources Conservation Service [NRCS] 2016a). Mean annual precipitation for the project area ranges from 13 to 18 inches, and mean annual air temperature ranges from 39 degrees Fahrenheit

(°F) to 45°F. Vegetation common to these soils includes range and pasture grass species of the midgrass prairie and woodland vegetation on steeper, wetter slopes. Soils in and surrounding the project area are often cultivated for grain or hay and pasture, with frost-free periods ranging from 120 to 135 days.

A number of soil series and components exist in the proposed project area (Appendix A) as a result of the weathering of several geomorphic features with differentiated geologic substrate; these soil series and components have been categorized into two soil groups based on geomorphology: 1) hills and ridges, and 2) plains and rises.

Hills and Ridges

The soils of hills and ridges compose approximately 1.60 acres (15.9%) of the project area (Table 3.1). These well-drained soils exist in diverse topographic terrain (6%–35% slopes) on hills and ridges weathered from sedimentary rock or mudstone (NRCS 2016a). Soils weathered on hills and ridges are generally deep, but may also include more shallow soils, with restrictive layers.

The hazard of water erosion increases on slopes greater than approximately 15% (NRCS 2016b). Some flow paths, rills, and pedestaled plants may be evident on these slopes. Reclamation potential of these soils is poor to good and is based on depth to bedrock and slope (NRCS 2016a).

Plains and Rises

The most predominant geomorphic soil group in the project area is soils of plains and rises. These soils cover approximately 8.53 acres (84.1%) of the project area (see Table 3.1). This soil group is characterized by deep, well-drained loams typically found in rolling terrain (6%–9% slopes). These soils formed in fine-loamy till (NRCS 2016a). The soil surface layer of these soils is often very shallow and characterized by clay loams and loams.

The soil surface of these soils is typically stable and intact, although these soils typically have an increased composition of stones and boulders. Some soils are effectively shallow, with natric horizons near the surface and hypersaline conditions limiting site potential. Areas of intact vegetation should exhibit slight evidence to no evidence of rills, wind-scoured areas, or pedestaled plants (NRCS 2016b). These soils have few to no soil constraints, and reclamation potential is generally fair to good.

Table 3.1. Soil Groups in the Project Area

Soil Group	Soil Map Units	Surface Runoff	Erodibility Rating	Reclamation Potential	Ecological Sites	Surface Disturbance (acres)*	% of Surface Disturbance
Hills and ridges	E0701F	Moderate to very high	Slight to severe	Poor to fair	Thin claypan (R054XY033ND)	1.63	15.86
					Claypan (R054XY021ND)		
					Shallow loamy (R054XY030ND)		
	E3555D				Loamy (R054XY031ND)		
					Thin Loamy (R054XY038ND)		
Plains and rises	E3541C	Moderate	Moderate	Good	Loamy (R054XY031ND)	8.53	84.14
					Thin Loamy (R054XY038ND)		
Total						**10.16**	**100.00**

Source: NRCS (2016a)

*

3.1.2.2 Environmental Consequences

The proposed project would involve short-term impacts on soil resources, which could result in the potential reduction of soil quality. Soil disturbance would be caused by the use of heavy machinery, the removal of vegetation, and the intermixing of topsoil and subsoil during grading and stockpiling. Important factors in determining the occurrence of soil impacts include the characteristics of the major soil types, vegetative cover, and slope. This section discusses potential soil impacts throughout the proposed project areas.

Sensitive soils typically include soils that have a shallow depth to bedrock; minimal surface-layer, sodic, or hypersaline soils with limited exchange capacity; soils of a texture that is more easily detached and eroded; and soils on steep slopes (greater than 25%) (NRCS 1998). Susceptibility to erosion may substantially increase when particular features exist in combination. The NRCS rates the susceptibility of all soils to water erosion. Wind erosion may also be a hazard, particularly when surface litter and vegetation are removed by surface-disturbing activities.

As vegetative cover is removed and the structural stability of the soil is disrupted, the potential for erosion increases (see Table 3.1). This potential degree of erosion depends upon slope, runoff probability, soil texture, and soil structure. Finely textured soils with poor structure are generally more prone to water erosion than are coarse, sandy soils. Silt loams and silty clay loams are particularly vulnerable to water erosion because of their fine particle size and decreased cohesiveness. However, elevated sandy textures make soils more sensitive to wind erosion. The project area includes soils that are susceptible to erosive forces, especially in the absence of vegetative cover resulting from grading and compaction from heavy machinery. Steep slopes can be highly susceptible to erosion, regardless of soil texture.

Soils in the project area may have increased concentrations of salts or sodium, creating saline or sodic conditions. Because of surface leaching and the mitigating effects of soil organic matter, surface soils typically have lower salt concentrations than subsoils; however, salvage and reclamation can often lead to topsoil and subsoil mixing that elevates surface soil concentrations to levels that exceed the salt thresholds of most upland plants. Although excess cations in salts are necessary plant nutrients, they could affect soil properties that often limit water availability to plants and impede plant growth, increasing the risk of wind and water erosion. Additional BMPs may be necessary to remediate the impacts of saline or sodic soils.

Some potential for erosion may exist in the project area, depending on surface disturbance, site-specific slope, soil type, erosion risk, construction technique, and long-term maintenance. Soil erodibility ratings are determined by evaluating the erosion susceptibility (i.e., wind and water erosion factors) with terrain slope and content of rock fragments (NRCS 1998). Erosion risk is described as slight, moderate, or severe. A rating of slight indicates that no erosion is likely, whereas a moderate rating indicates that erosion is likely but can be controlled with simple erosion-control measures. However, a severe erodibility rating indicates that erosion is expected and that more costly and active erosion-control measures would be necessary.

Keeping in mind the general and site-specific measures identified in Section 2.1.2, the potential impacts from erosion for the proposed well pad include the following:

- The proposed compressor station and access road would be constructed in soils that predominantly consist of Williams-Zahl loams (approximately 84%), which are soils with good reclamation potential with no limitations.
- Soils in the compressor station and access road locations have moderate to very high surface runoff and a slight to severe erosion risk, depth to bedrock, slope.

The overall percentage of surface disturbance for each soil series is summarized in Table 3.2 and is based on the spatial extent of the soil series derived from NRCS data. The soil map units are approximations of the existing soils across the landscape acreage and, therefore, are used to make best estimates to describe the soil distribution for the proposed project area. A number of soil series exist in the project area as a result of the weathering of surfaces of several geomorphic features with differentiated geologic substrate (Figure 3.1). Soil component characteristics for each soil series are described in Appendix A (NRCS 2016a).

Table 3.2. Soil Series in the Area of Disturbance

Map Symbol	Soil Series	Acres*	% of Project Area Disturbance
E0701F	Dogtooth-Janesburg-Cabba complex, 6 to 35 percent slopes	1.57	15.47
E3541C	Williams-Zahl loams, 6 to 9 percent slopes	8.54	84.14
E3555D	Zahl-Williams loams, 9 to 15 percent slopes	0.03	0.0039
Total		**10.136**	**100.0**

Source: NRCS (2016a)

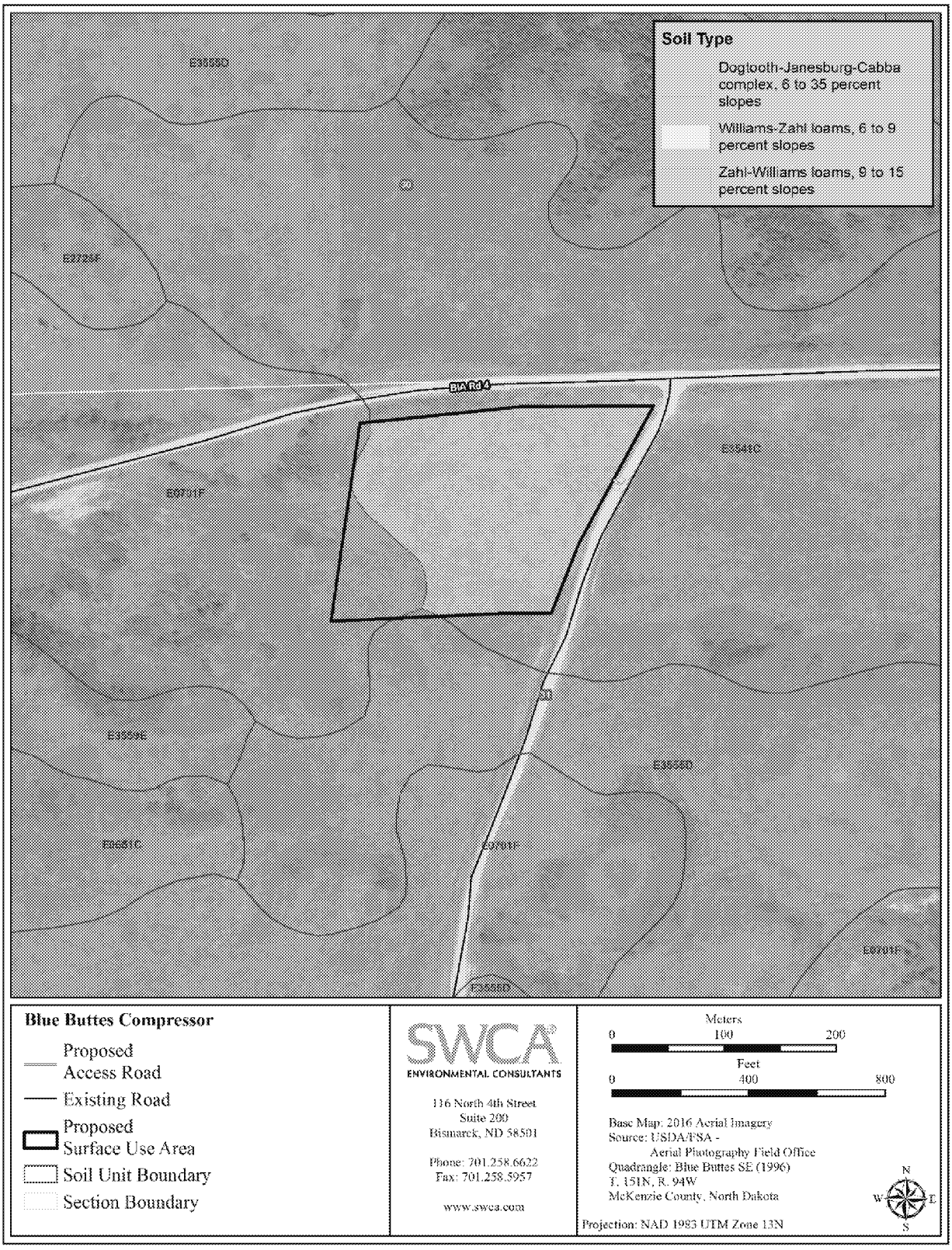

Figure 3.1. Soil units in and around the project area.

Because of the relatively small area of soils being impacted, combined with the effective implementation of BMPs, the proposed project would not cause unmanageable erosion issues or interfere with reclamation of the area. To minimize soil impacts during construction and operation activities, Targa would minimize disturbance areas and implement appropriate BMPs and mitigation measures. These measures are described in detail in Section 2.1.2.2. The implementation of applicant-committed BMPs measures by the operator would reduce project effects and maintain negligible levels of erosion; therefore, no significant adverse impacts to soil resources would be anticipated.

3.1.3 Geology

The analysis area for geologic resources is based on information from the broader area surrounding the 10.13-acre project area. This is due to the fact that analysis of geology requires looking at natural events and other actions that have occurred over millions of years over a large scale area that has changed and shifted in a region to piece together a geologic timeline to explain current conditions.

3.1.3.1 Affected Environment

Geology

The project area is located in the central portion of the Williston Basin, west of the Nesson Anticline, a north-south-trending asymmetrical fold that began forming in what is now North Dakota during the early Phanerozoic and continued until the mid-Tertiary. The basin consists of deep layers of sedimentary rock deposited over time above a Precambrian geologic basement (Figure 3.2). These sedimentary units consist of thick accumulations of limestone and dolomite that were deposited in the basin during the Cambrian, Ordovician, Silurian, and Devonian periods and that are interspersed with thinner deposits of sandstone, siltstone, shales, and salts (Peterson 1995). Deposition has continued in the basin through the current geological epoch, with the maximum depth of sedimentary deposits of approximately 16,000 feet in the area of Williston, North Dakota (Peterson 1995).

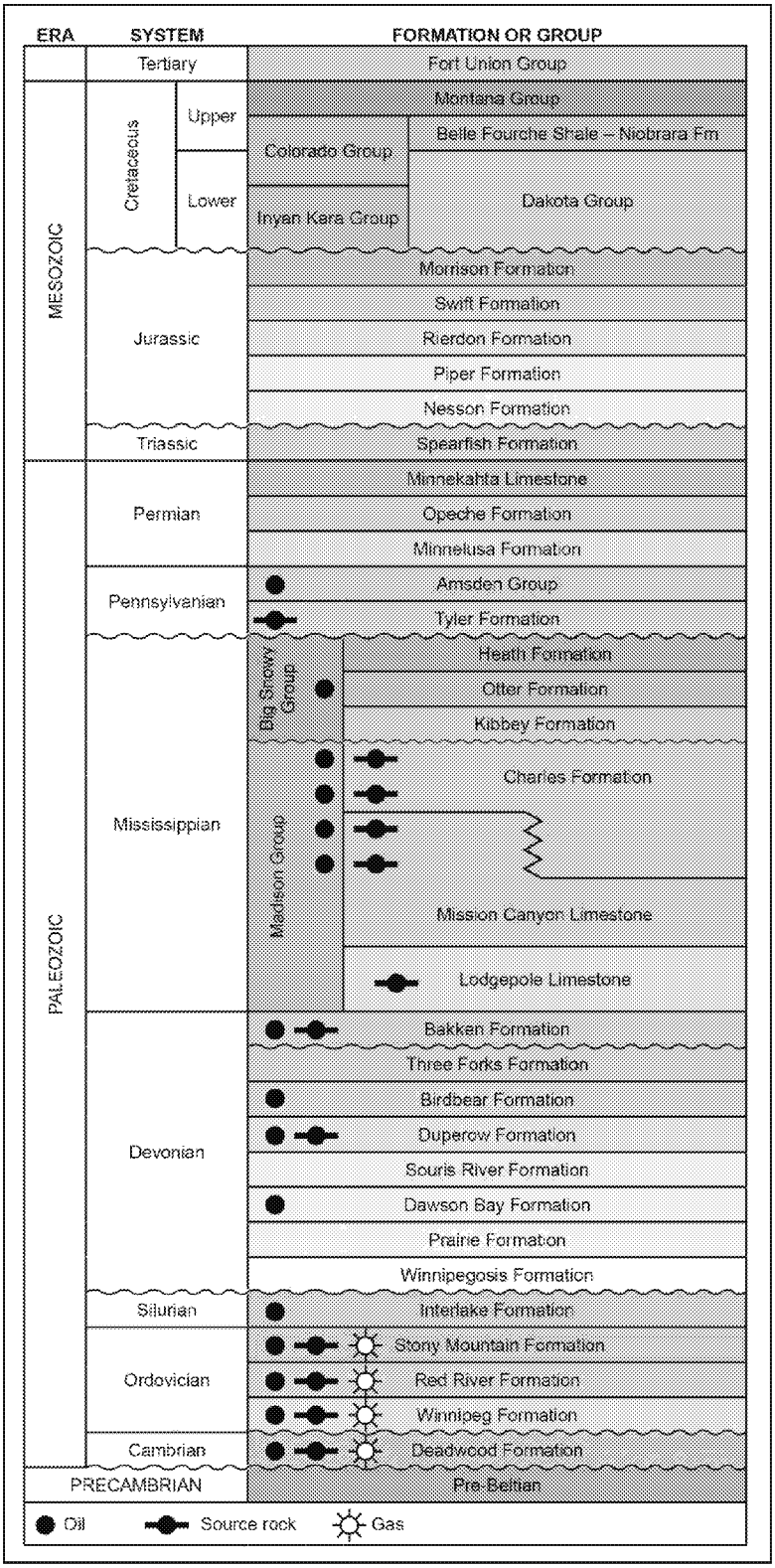

Figure 3.2. Typical stratigraphic column of the Williston Basin, including oil- and gas-bearing formations (Peterson 1995).

The underlying Bakken and Three Forks Formations are well-known sources of hydrocarbons in the Williston Basin. Although earlier oil and gas exploration activity within the FBIR was limited and commercially unproductive, recent economic changes and technological advances now make accessing oil in these formations more feasible.

The Bakken Formation was deposited during the late Devonian and early Mississippian, from 417 to 350 million years ago. It is approximately 11,000 feet deep at its deepest location and approximately 8,500 feet below the ground surface within the FBIR. The formation is typically 158 feet thick and is composed of an upper and lower member that consist of marine shales and a middle member that consist of thick interbedded layers of siltstone, dolomite, and sandstone. The Bakken Formation is located between thick and exceptionally tight formations of low-permeability carbonates: the Three Forks Formation lies below the Bakken Formation and is approximately 250 feet thick, whereas the Lodgepole Formation (Limestone) lies above the Bakken Formation and is approximately 900 feet thick. These massive limestone formations have acted as seals for Bakken Formation hydrocarbons and have contributed to the trapping and development of mature crude oil deposits (Energy Information Administration 2006).

Regional subsidence of the Williston Basin during the Cretaceous period and tectonic activity during the Laramide Orogeny produced geological anticlines that serve as traps for petroleum resources (Peterson 1995). Oil was first discovered in the Williston Basin at the Cedar Creek Anticline in the 1920s, and subsequently in the extensive Bakken Formation, primarily along the Nesson Anticline in North Dakota. These and other oil- and gas-producing formations have resulted in the development of major oil fields since the 1950s. However, technical hurdles limited efficient oil recovery until 2004 (Energy Information Administration 2006).

Land within the FBIR consists of four Level IV ecoregions: 1) the Missouri Coteau Slope north of Lake Sakakawea, 2) the Missouri River Breaks along the shores of Lake Sakakawea, 3) the Little Missouri River badlands southwest of Lake Sakakawea, and 4) the Missouri Plateau south and west of Lake Sakakawea (Bryce et al. 1998). Elevations vary across these topographically variable ecoregions, from a normal pool elevation of 1,838 feet at Lake Sakakawea to approximately 3,300 feet in the Killdeer Mountains. Thick sequences of sedimentary rocks are exposed in some areas.

Published geologic mapping (Bluemle 1971, 1989; Carlson 1973, 1985; Clayton 1972; Murphy 2001) indicates that three Paleocene- to Eocene-age geologic formations and numerous late Tertiary and Quaternary surficial deposits are exposed at the surface on the FBIR. These are, in ascending stratigraphic order, the Paleocene-age Bullion Creek (Tongue River) and Sentinel Butte Formations; the Paleocene- to Eocene-age Golden Valley Formation; unnamed late Tertiary and early Pleistocene sands and gravels; the Pleistocene-age Coleharbor Formation; and Holocene-age alluvial deposits, including those of the Walsh and Oahe Formations. The Paleocene- and Eocene-age units were deposited in a terrestrial setting after the Western Interior Seaway, which had covered much of central North American during the Cretaceous, underwent its final major regressive depositional cycle. The Quaternary deposition occurred in a glaciated environment, often resulting in thick sequences of glacially derived sedimentary deposits. From Quaternary to recent times, the landscape has been altered as a result of erosion by water and wind, forming the modern topography.

3.1.3.2 Environmental Consequences

Proposed Project

The proposed compressor station would is intended to provide reliable transport of existing oil wells and may also provide this function for new exploratory wells that would target the Bakken and Three Forks Formations. However, impacts to geology that would occur from the proposed project are limited to the 10.13-acre area of disturbance and soils removal would largely be limited to topsoils and would not require deep cut and fill. Impacts to underlying geology would not occur or would be negligible.

Sand, gravel, and other materials used for construction of the compressor station foundation and access road would be permanently relocated and converted to hard surface. Sand, gravel, and other materials used for construction of the access road also would be permanently relocated and converted to hard surface, unless agreements are in place to turn over ownership of the access road to a private landowner, as detailed in Section 2.1.1.5. However, the total area of the proposed project would be 10.13 acres. Use of these local fill materials would have minor effects to geologic resources because of the relatively small requirement for fill surfacing materials in relation to the availability of existing material sources on and off the FBIR.

3.2 Water Resources

This section identifies existing water resources in the project area and its surrounding watershed and the potential effects of the proposed project on those resources. Specific subjects discussed in this section include surface water and surface water quality, groundwater resources, hydraulic fracturing (HF), and the potential short-term and long-term impacts of the proposed project on water resources.

Water resources in the project area would be managed and protected according to existing federal law and policies regarding the use, storage, and disposal of these resources during construction of project facilities and operation of the project. Surface water resources use and protection are administered under the following federal laws:

- The Clean Water Act (CWA)
- The Safe Drinking Water Act of 1974, as amended (42 United States Code [USC] 300 et seq.)

Water quality is protected under the Federal Water Pollution Control Act (as amended), otherwise known as the CWA. The CWA includes rules for regulating discharges of pollutants into waters of the U.S. and regulates water quality standards for surface waters. The CWA has also made it unlawful to discharge any pollutant from a point source, including stormwater discharges, into any navigable waters of the U.S., unless a permit has been obtained from the NPDES program. The Environmental Division of the MHA Nation has had an application pending with the U.S. Environmental Protection Agency (EPA) since 1996 for delegation of authority to set federally approved water quality standards on the FBIR. In the absence of tribal authorities to oversee surface water quality, enforcement of federal environmental laws regarding surface water on the

FBIR is accomplished through permitting, inspection, and monitoring activities of the NPDES program, as administered by the EPA.

Stormwater discharges from oil and gas exploration, production, processing, and treatment operations are generally exempt from NPDES requirements, provided that the stormwater does not come into contact with materials such as oil and gas products or waste products or mingle with other discharges such as production water. Under this exemption, a permit is not required unless reportable quantities of oil or other hazardous materials are discharged or the discharge contributes to violation of a water quality standard.

3.2.1 Surface Water

The analysis area for surface water resources extends beyond the immediate project area because of the ability for surface water runoff to have a watershed-level effect. Therefore, the subwatershed and watershed around the project area are included in this analysis of the proposed project.

3.2.1.1 Affected Environment

Surface water is abundant in the watershed and subwatersheds surrounding project area, as shown in Figure 3.3 (North Dakota Department of Health [NDDH], Division of Water Quality 2014). The proposed project area is located in the Lake Sakakawea sub-basin (Hydrologic Unit Code [HUC] 10110101). The Blue Buttes Compressor Station project area is in the Clarks Creek subwatershed (HUC 101101011904). Runoff from the compressor station project area would flow overland to the north and enter a draw approximately 0.18 mile from the compressor station, where the surface water runoff would flow south and then east approximately 5.05 river miles to Bear Dens Creek, approximately 3.79 river miles from Lake Sakakawea (Figure 3.4).

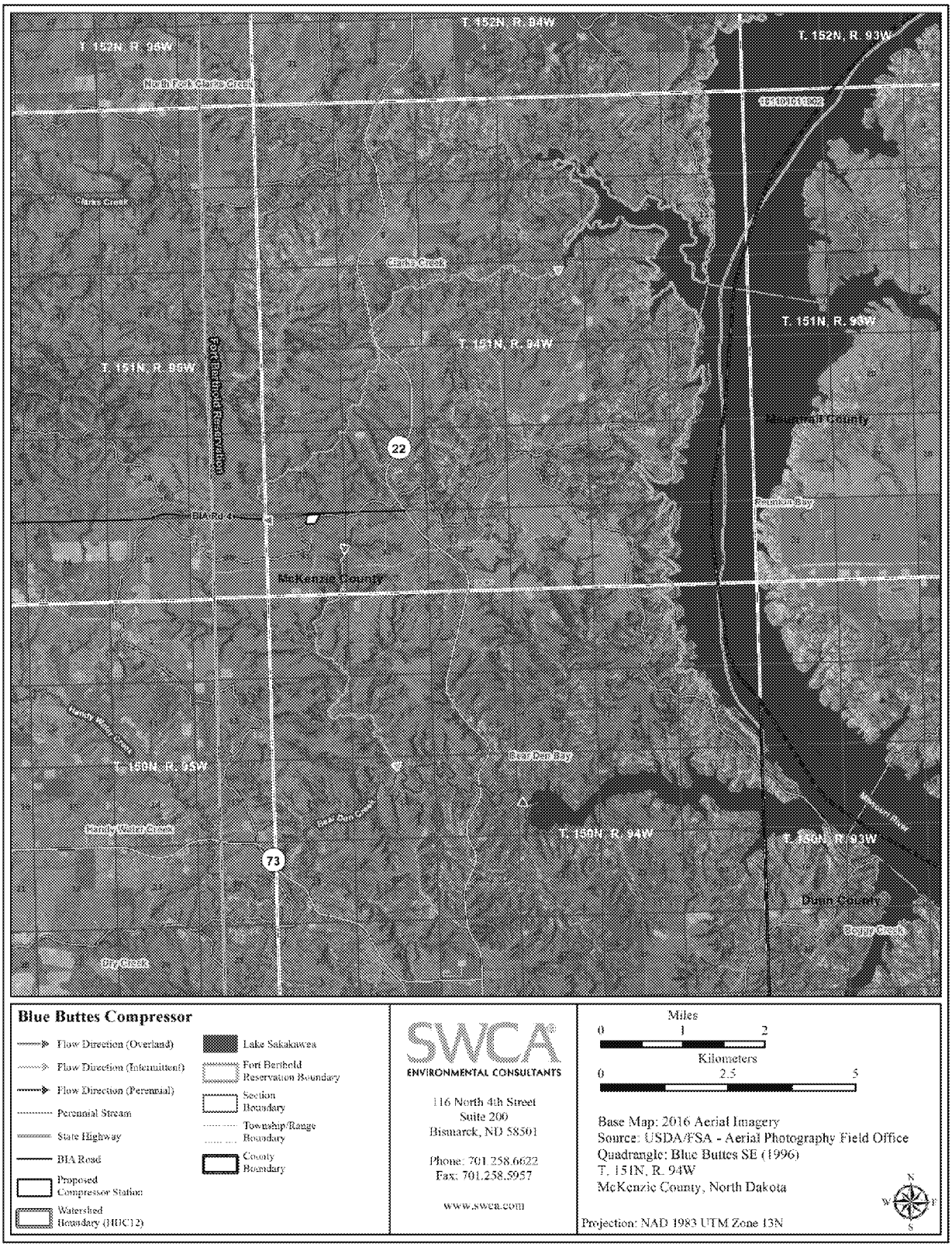

Figure 3.3. Watershed and subwatersheds near the TAT Blue Buttes Compressor Station (NDDH, Division of Water Quality 2014).

Uses of the Clarks Creek watershed are listed as agricultural and industrial (EPA 2017a). The overall status of this waterbody is good. The Lake Sakakawea watershed uses are listed as agriculture, fish and other aquatic biota, fish consumption, industrial, municipal/domestic, and recreation (EPA 2012a). The Watershed Assessment, Tracking, and Environmental Results System lists the status of fish consumption for Lake Sakakawea as "impaired" because of mercury levels (EPA 2012a). The overall status of Lake Sakakawea is impaired. No ongoing discharge of water to surface waters of the U.S. would be required for this project. Although an NPDES permit might not be required for stormwater discharges, BMPs and sediment controls would still be implemented to minimize impacts to surface water quality.

3.2.1.2 Environmental Consequences

Proposed Project

The proposed project would represent little risk to surface water quality as a result of soil erosion and stormwater runoff in the project area. Implementation of the proposed project would result in 10.13 acres of long-term surface disturbance. Targa has adopted construction BMPs and site-specific erosion protection measures (Section 2.1.2.2) that would reduce or minimize surface and stormwater runoff and potential surface water degradation from project construction. During construction and operation of the project, Targa would implement all BMPs, erosion-control measures, and spill prevention practices. These measures would reduce long-term erosion and runoff from the sites. Effective implementation of these measures, combined with the project's distance from perennial waterbodies (5 miles), would further protect existing surface water resources from sedimentation.

Implementation of the proposed project could result in project-related spills of fuel or other hazardous chemicals and therefore degradation of water quality. The potential for surface water impacts from project-related spills has been reduced through project siting and the Targa mitigation and protective measures outlined in Section 2.1.2.2. Siting of the compressor station and access road away from wooded draws, perennial streams, and Lake Sakakawea would reduce the potential for project-related erosion or spills from reaching surface water resources and the volume of project-related erosion or spills. The compressor station would be approximately 0.18 straight-line mile from the closest wooded draw and 5.05 river miles from Clarks Creek, the nearest perennial stream. As part of the NPDES construction permit, the proposed project would be engineered and constructed to minimize the suspended sediment concentration (i.e., turbidity) of surface runoff, avoid disruption of drainages, and avoid direct impacts to surface water.

The potential for surface water impacts from operating the compressor station would be reduced through Targa's commitment to BMPs and spill prevention (see Section 2.1.2.1)

With the implementation of erosion-control and spill prevention measures, the proposed project would not likely result in adverse effects to surface water quality.

3.2.2 Groundwater

The analysis area for groundwater resources extends beyond the immediate project area because of the connection of groundwater in the project area to the aquifers in the project area and surrounding region. Therefore, the regional aquifers within around the project area are included in this analysis. The existing affected environment for groundwater and the potential impacts to groundwater aquifers and drinking water wells from the proposed project.

3.2.2.1 Affected Environment

Groundwater Aquifers and Typical Groundwater Quality

Aquifers in the project area and surrounding region include, from shallowest to deepest, the Tertiary Sentinel Butte, Tongue River, and Cannonball/Ludlow Formations and the Cretaceous Hell Creek and Fox Hills Formations (Table 3.3). These aquifers lie at depths ranging from 0 to 2,000 feet below the surface. Shallow post-glacial outwash aquifers are located elsewhere in the Williston Basin but do not exist within the proposed project area. Shallow wells drilled to the Sentinel Butte and Tongue River Formations at depths ranging from 100 to 750 feet below the surface are often used for cattle watering. These wells typically contain total dissolved solids (TDS) levels of less than 3,000 parts per million (ppm). The shallow Sentinel Butte Formation is commonly used as a domestic water source in McKenzie County and meets the standards of the NDDH (Croft 1985; Klausing 1979). Many wells are drilled in the basal Fox Hills for domestic purposes throughout the Williston Basin at depths ranging from 1,300 to 1,800 feet below the surface. The TDS level of the Fox Hills aquifer normally ranges from 2,500 to 3,000 ppm, producing good drinking water. Detailed analyses are available from the North Dakota Geological Survey, Bulletin 68, Part III, and Bulletin 80, Part III (Klausing 1979 and Croft 1985, respectively).

Table 3.3. Common Aquifers in the Proposed Project Area and Surrounding Region

Period	Formation		Depth Range (feet)	Thickness (feet)	Lithology	Water-Yielding Characteristics
Quaternary	Alluvium		0–40	40	Silt, sand, and gravel	50 gallons per minute (gal/min) from sand and gravel deposits
Tertiary	Fort Union Group	Sentinel Butte	0–670	0–670	Silt, clay, sand, and lignite	5–100 gal/min in sandstone; 1–200 gal/min in lignite
		Tongue River	140–750	350–490	Silt, clay, sand, and lignite	Generally less than 100 gal/min in sandstone
		Cannonball/ Ludlow	500–1,150	550–660	Fine- to medium-grained sandstone, siltstone, and lignite	Generally less than 50 gal/min in sandstone
Cretaceous	Hell Creek		1,000–1,750	200–300	Claystone, sandstone, and mudstone	5–100 gal/min in sandstone
	Fox Hills		1,100–2,000	200–300	Fine- to medium-grained sandstone and some shale	Generally less than 200 gal/min in sandstone; some up to 400 gal/min

Sources: Croft (1985); Klausing (1979)

Existing Groundwater Wells

Data from the North Dakota State Water Commission (2017) indicate that there is one existing groundwater wells within 1 mile of the compressor station (Figure 3.4).

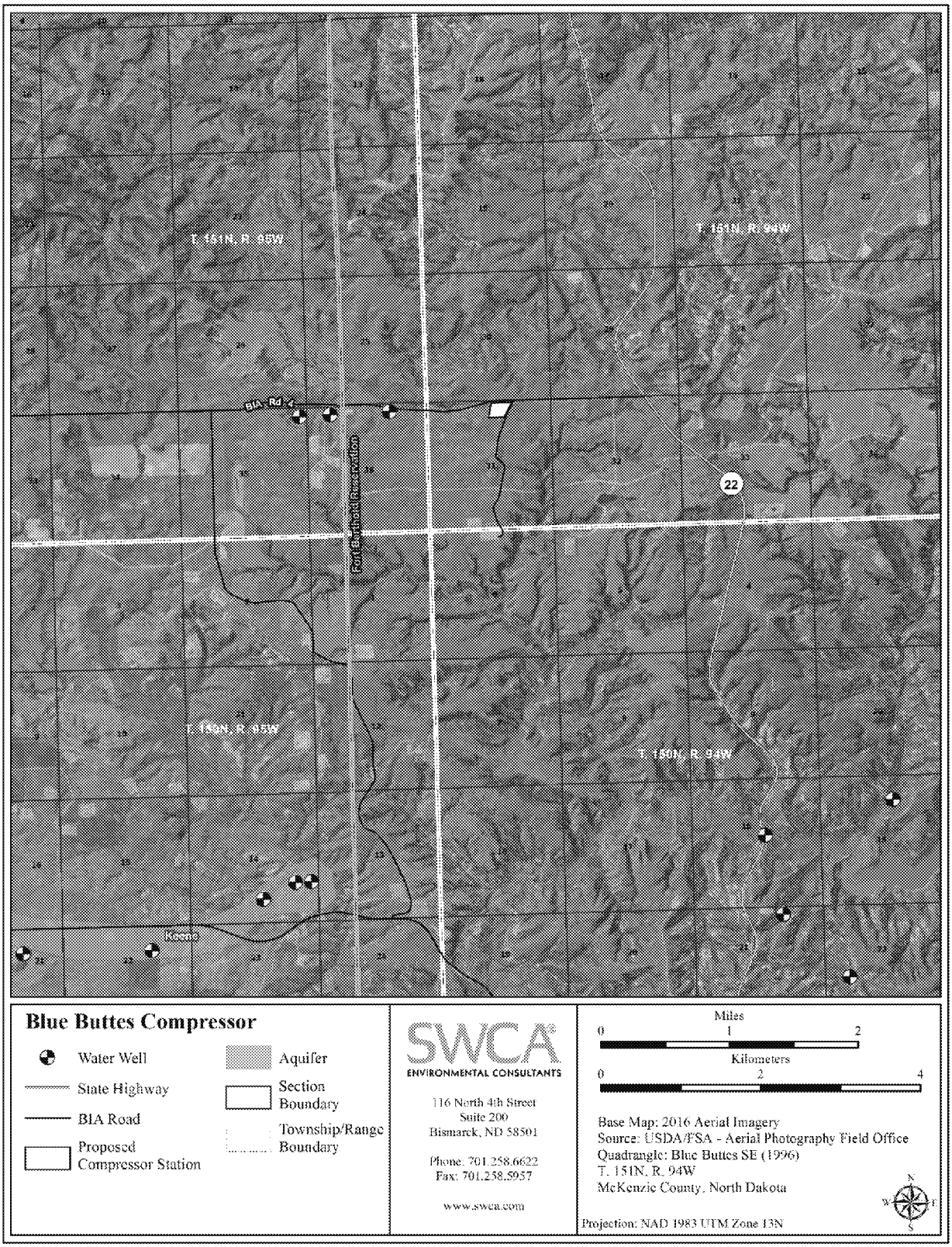

Figure 3.4. Existing water wells near the TAT Blue Buttes Compressor Station (NDDH, Division of Water Quality 2017)

3.2.2.2 Environmental Consequences

Drinking water aquifers are primarily located at depths of less than 2,000 feet, including water-bearing parts of the Sentinel Butte, Tongue River, Cannonball/Ludlow, Hell Creek, and Fox Hills Formations. Water quality of current and future groundwater wells in the vicinity would not be affected because the compressor station would not require deep cut and fill during excavation. Additionally, the compressor station would be included in Targa's SCADA system to prevent and detect any leaks that may occur and potentially affect groundwater resources.

3.3 Air Quality

Under the Clean Air Act (CAA), tribal sovereignty is limited; a tribe may implement the CAA only with permission of the EPA, and only if the tribe demonstrates it is capable of acting like a state. In the absence of such a demonstration, EPA regulates air quality in Indian Country under the CAA. States generally do not have any CAA authority in Indian Country and the FBIR does not have an EPA-approved CAA program.

Implementation of the proposed project could result in the release of regulated pollutants into the atmosphere and the degradation of air quality. The primary factors that influence regional ambient air quality are the location of air pollution sources, the quantity and chemical characteristics of pollutants emitted by those sources, the topography of the region, and local meteorological conditions.

The analysis area for air quality extends beyond the immediate project area because of the ability of air quality emissions to disperse under various meteorological conditions. Therefore, a 50-kilometer (km) radius (approximately 31-mile radius) around the project area is included in this analysis. The existing affected environment for air quality and the potential impacts to air quality and climate change from the proposed project are discussed in this section.

3.3.1 Affected Environment

3.3.1.1 Climate

North Dakota's climate is characterized by great temperature variation across all time scales, which is perhaps the climate's most important feature. Throughout a typical year in North Dakota, the temperature fluctuates between 13°F and 69°F for an annual average temperature of 41.5°F. The state's climate is also characterized by light to moderate, irregular precipitation; plentiful sunshine; and nearly continuous wind (because no barriers to the north or south inhibit air masses), often resulting in large day-to-day temperature fluctuations. On average, approximately 75% of North Dakota's annual precipitation falls from April to September, and for the coldest months (November through February), precipitation averages only approximately 0.5 inch per month, mostly as snow. The average annual precipitation level is 16.16 inches. Representative climate conditions in the proposed project area are presented in Table 3.4.

Table 3.4. Representative Climate Conditions in the Proposed Project Area

Month	Condition	
	Average Temperature (°F)	Average Precipitation (inches)
January	13.0	0.46
February	17.8	0.40
March	28.7	0.75
April	42.4	1.22
May	53.4	2.31
June	62.7	3.15
July	69.0	2.53
August	67.8	1.67
September	56.6	1.37
October	43.1	1.23
November	28.1	0.61
December	15.5	0.46

Source: North Dakota State Climate Office (2012).

Note: Historical weather data averaged for North Dakota Regions 1, 4, and 7 (western North Dakota) from 1981 to 2010.

3.3.1.2 Legal and Regulatory Framework

The CAA of 1970 (42 USC 7401 et seq.), as amended in 1977 and 1990, is the basic federal statute governing air pollution. Provisions of the CAA that are potentially relevant to the proposed project are the national ambient air quality standards (NAAQS), the prevention of significant deterioration (PSD) action, the nonattainment new source review (NSR) process, the federal implementation plan (FIP) for the FBIR, conformity regulations, the new source performance standards (NSPS), and the National Emission Standards for Hazardous Air Pollutants (NESHAPs).

Air Emission Sources at Oil and Gas Sites

The typical sources of air emissions that could be used under the proposed project include the following:

- Compression and spark ignition engines for compression and power generation
- Fugitive emissions

New Source Performance Standards

Pursuant to Section 111 of the CAA, the EPA has authorized technology-based standards that apply to specific categories of stationary sources. These standards are referred to as NSPS and are found in 40 Code of Federal Regulations (CFR) 60. The NSPS apply to new, modified, and reconstructed affected facilities in specific source categories. Potentially applicable NSPS for oil and gas exploration and date of applicability are presented in Table 3.5 and are described in more detail below.

Table 3.5. Potential Applicable New Source Performance Standards for the Proposed Project

40 CFR 60 Subpart	Title	Applicability Date
A	General Provisions	N/A
IIII	Stationary Compression Ignition Internal Combustion Engines	After July 11, 2005
JJJJ	Stationary Spark Ignition Internal Combustion Engines	After June 12, 2006
OOOO	Crude Oil and Natural Gas Production, Transmission, and Distribution	After August 23, 2011
OOOOa	Crude Oil and Natural Gas Production, Transmission, and Distribution	After September 18, 2015

- 40 CFR 60 Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE). Subpart IIII applies to owners and operators of stationary CI ICE that commence construction after July 11, 2005, where the stationary CI ICE are manufactured after April 1, 2006, and are not fire pump engines. This subpart sets emission standards for oxides of nitrogen and non-methane hydrocarbons, nitrogen oxides (NO_X), carbon monoxide (CO), and particulate matter (PM).
- 40 CFR 60 Subpart JJJJ - Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (SI ICE). Subpart JJJJ applies to owners and operators of stationary SI ICE that commence construction after June 12, 2006, where the stationary SI ICE are manufactured on or after July 1, 2007. This subpart sets emission standards for NO_X, CO, and volatile organic compounds (VOCs).
- 40 CFR 60 Subpart OOOO - Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution. This subpart establishes emission standards and compliance schedules for the control of VOCs and sulfur dioxide (SO_2) emissions from affected facilities that commence construction, modification, or reconstruction after August 23, 2011. These regulations require VOC reductions from hydraulically fractured completions of new gas wells and HF or refracturing of existing gas wells, centrifugal and reciprocating compressors, pneumatic controllers, condensate and crude oil storage tanks, and natural gas processing plants. On August 18, 2015, the EPA proposed to amend 40 CFR 60 Subpart OOOO with clarifications that methane (CH_4) is a regulated pollutant under this subpart. However, the amendment did not change the list of affected emission sources. The rule was finalized and published in the *Federal Register* on June 3, 2016, and the rule became effective on August 2, 2016 (EPA 2016).
- 40 CFR 60 Subpart OOOOa - Standards for New and Modified Sources in the Oil and Natural Gas Sector. This subpart establishes emission standards for the control of CH_4 and VOCs. The EPA proposed this rule on August 18, 2015, and it was published in the *Federal Register* on September 18, 2015. The rule was finalized and published in the *Federal Register* on June 3, 2016, and became effective on August 2, 2016 (EPA 2016). The rule regulates additional emission sources not covered by Subpart OOOO. Sources covered would include completions of hydraulically fractured or refractured oil and gas wells, compressors, fugitive equipment leaks, pneumatic controllers, pneumatic pumps, and storage tanks.

National Emissions Standards for Hazardous Air Pollutants

Section 112 of the CAA established NESHAPs, which are stationary source standards for hazardous air pollutants (HAPs). HAPs are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. If manufactured after December 19, 2002, drilling rig engines may be regulated under 40 CFR 63, Subpart ZZZZ, Stationary Reciprocating Internal Combustion Engines. Although the engine is not considered a point source, NESHAPs require the manufacturer of the engine to meet the emission requirements of the rule.

National Ambient Air Quality Standards

Title I of the CAA requires the EPA to establish NAAQS for pollutants considered harmful to public health and the environment. The EPA established NAAQS for six common principal pollutants ("criteria" pollutants). Criteria pollutants are CO, nitrogen dioxide (NO_2), SO_2, ozone (O_3), lead, and PM, including PM equal to or less than 10 microns in diameter (PM_{10}) and 2.5 microns in diameter ($PM_{2.5}$).

The CAA identifies two types of NAAQS: primary and secondary. Primary standards provide public health protection, including protecting the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

The NAAQS undergo periodic revisions to ensure that emerging science and technology result in the most up-to-date and protective standards achievable. On October 1, 2015, the EPA strengthened the NAAQS for O_3. Based on the agency's review of the air quality criteria for O_3 and related precursors, the EPA revised the primary and secondary O_3 NAAQS to 0.070 ppm for an 8-hour averaging time (from 0.075 ppm). The final rule became effective on December 28, 2015 (North Dakota Administrative Code 33-15-02; EPA 2017b).

The NDDH Air Quality Division regulates air quality throughout the state, except in connection with Native American reservations. The FBIR is regulated under the NAAQS. Although the proposed project would be located on the FBIR, information about surrounding air quality and regulations characterizes the immediate environment. North Dakota has promulgated state ambient air quality standards (AAQS) to supplement the national standards (i.e., NAAQS). The North Dakota AAQS include hydrogen sulfide (H_2S), but for all other pollutants, the NAAQS are equivalent to or more stringent than those AAQS. Table 3.6 summarizes the state AAQS and the NAAQS for criteria pollutants.

Table 3.6. National and State Ambient Air Quality Standards

Pollutant	Averaging Time	NAAQS		North Dakota AAQS
		Primary Standard	Secondary Standard	Level
CO	1-hour	35 ppm	–	35 ppm
	8-hour	9 ppm	–	9 ppm
Lead	3-month	0.15 µg/m^3	0.15 µg/m^3	0.15 µg/m^3
NO_2	1-hour	100 ppb	–	0.100 ppm
	Annual	53 ppb	53 ppb	0.053 ppm
O_3	8-hour	0.070 ppm	0.070 ppm	0.070 ppm
PM_{10}	24-hour	150 µg/m^3	150 µg/m^3	150 µg/m^3
$PM_{2.5}$	24-hour	35 µg/m^3	35 µg/m^3	35 µg/m^3
	Annual	12 µg/m^3	15 µg/m^3	12.0 µg/m^3
SO_2	1-hour	0.075 ppm	–	0.075 ppm
	3-hour	–	0.5 ppm	0.5 ppm
H_2S	Instantaneous	–	–	10.0 ppm
	1-hour	–	–	0.20 ppm
	24-hour	–	–	0.10 ppm
	3-month	–	–	0.02 ppm

Sources: North Dakota Administrative Code 33-15-02; EPA (2017b).

Note: ppb = parts per billion, µg/m^3 = micrograms per cubic meter.

The state of North Dakota is in attainment for all AAQS for criteria pollutants *and is in achievement with the state and federal ambient air quality standards*. The existing air quality can be characterized by the ambient air quality background values. The NDDH operates ambient monitoring sites designed to characterize regional background concentrations of criteria pollutants. The EPA selected the Dunn Center monitoring site as the most appropriate background site for the FBIR in development of the FIP because it is a rural background monitor that is influenced by regional energy development activity (*Federal Register* 2013). This monitor will also be used to characterize background ambient air quality data for the project area. The Dunn Center monitoring site ambient air quality background values for criteria pollutants and the NAAQS are presented in Table 3.7 for comparison.

Table 3.7. Comparison of FBIR Air Quality Data for 2013 to the NAAQS

Criteria Pollutant	Averaging Period	NAAQS	Dunn Center
SO_2	1-hour	75 ppb	9.00 ppb
	3-hour	500 ppb*	4.40 ppb
	24-hour	140 ppb*	2.00 ppb
	Annual	30 ppb*	0.36 ppb
PM_{10}	24-hour	150 µg/m^3	16.80 µg/m^3
$PM_{2.5}$	24-hour	35 µg/m^3	15.00 µg/m^3
	Annual	12 µg/m^3	5.50 µg/m^3
NO_2	1-hour	100 ppb	10.00 ppb
	Annual	53 ppb*	1.72 ppb
O_3	8-hour	70 ppb*	56.00 ppb

Sources: North Dakota Department of Health (2014); EPA (2017b).

Note: ppb = parts per billion, µg/m^3 = micrograms per cubic meter.

* Actual standard based as equivalent value in ppm (1,000 ppb is equivalent to 1 ppm).

Greenhouse Gases and Climate Change

Gases that trap heat in the atmosphere are called greenhouse gases (GHGs). Adverse health effects and other impacts caused by elevated atmospheric concentrations of GHGs occur through climate change. Climate impacts are not attributable to any single action but are exacerbated by diverse individual sources of emissions that each make relatively small additions to GHG concentrations.

GHGs absorb heat and slow the rate at which energy escapes to space. Some GHGs are more effective at absorbing energy and stay in the atmosphere longer than others. Equivalent carbon dioxide (CO_2e) is the amount of carbon dioxide (CO_2) that would cause the same level of warming as a unit of one of the other GHGs. The principal GHGs that enter the atmosphere because of oil and gas exploration and production include CO_2, CH_4, and nitrous oxide (N_2O) (EPA 2015). For example, 1 ton of CH_4 has a CO_2e of 25 tons; therefore, 25 tons of CO_2 would cause the same level of warming as 1 ton of CH_4. N_2O has a CO_2e value of 298 (40 CFR 98).

The 2013 Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report states that the atmospheric concentrations of well-mixed, long-lived GHGs, including CO_2, CH_4, and N_2O, have increased to levels unprecedented in at least the last 800,000 years. Further human influence has been detected in warming of the atmosphere and the ocean, changes in the global water cycle, reductions in snow and ice, global mean sea level rise, and changes in some climate extremes. It is extremely likely (95%–100% probability) that human influence has been the dominant cause of the observed warming since the mid-twentieth century (IPCC 2013).

Global mean surface temperatures have already increased 1.5°F (from 1880 to 2012). Additional near-term warming is inevitable because of the thermal inertia of the oceans and ongoing GHG emissions. However, climate change will impact regions differently and warming will not be equally distributed. Both observations and computer model predictions indicate that increases in temperature are likely to be greater at higher latitudes, where the temperature increase may be more than double the global average. Models also predict increases in duration, intensity, and

extent of extreme weather events. Warming of surface air temperature over land will very likely be greater than over oceans (IPCC 2013).

The Council on Environmental Quality (CEQ) final GHG guidance states that agencies should consider the potential effects of a proposed project on climate change by assessing GHG emissions. Agencies should also consider the effects of climate change on the proposed project and its environmental impacts (CEQ 2016).

Prevention of Significant Deterioration

New projects within attainment or unclassified areas, designated under CAA Section 107, must demonstrate conformance with limits defined under the PSD program. Although the proposed project would not be a PSD source, the PSD program is intended in part to prevent violations of the NAAQS and to protect the environment in general, including air quality and visibility in special designated areas.

The PSD requirements provide maximum allowable increases in pollutant concentrations for areas that are already in compliance with the NAAQS. These limited increases occur in designated increments, and as a new PSD source is permitted in an airshed, the amount of available incremental change allowable in that airshed is reduced. Certain sensitive areas, defined as Class I areas under the CAA, have a smaller allowable incremental increase in new emissions than Class II and Class III areas. Class II areas are not established as Class I areas and are allowed more moderate pollution increases. Class III areas are not subject to any air quality standards, and the air quality may be degraded to levels in line with the NAAQS. To date, no Class III areas have been designated. The maximum allowable PSD increments over baseline are presented in Table 3.8.

Table 3.8. Prevention of Significant Deterioration Class I and II Increments

Pollutant	Averaging Time	PSD Increments Class I (µg/m^3)	PSD Increments Class II (µg/m^3)
PM_{10}	Annual	4	17
	24-hour	8	30
$PM_{2.5}$	Annual	1	4
	24-hour	2	9
SO_2	Annual	2	20
	24-hour	5	91
	3-hour	25	512
NO_2	Annual	2.5	25
CO	8-hour	N/A	N/A
	1-hour	N/A	N/A

Source: 40 CFR 52.21.

Note: µg/m^3 = micrograms per cubic meter.

To assess impacts to Class I areas, the standard visual range (SVR) is used to quantify existing visibility conditions. The SVR is the greatest distance (in km) at which a large, dark object can be seen. Nitrogen and sulfur deposition from emissions may have a negative impact on air quality–related values.

The nearest designated Class I area to the project area is the Theodore Roosevelt National Park (TRNP), which covers approximately 110 square miles in three geographically separated units within the Little Missouri National Grassland. TRNP is approximately 16 miles south of Watford City, North Dakota, and approximately 28 miles southwest of the proposed compressor station. In TRNP, the means of the values for days with the worst visual range (the lowest 20th percentile) have remained relatively unchanged from 2001 through 2014, with an average SVR value of 73.2 km. During days with the best visual range (the highest 20th percentile), SVR improved from 189.2 km in 2001 to 226.0 km in 2014. For all days, the SVR has remained relatively flat from 2001 to 2014, with an average of 134.5 km (Interagency Monitoring of Protected Visual Environments 2016). Generally, the levels of dry and wet deposition in the western United States (including western North Dakota) are much lower than those in the eastern United States. The total (dry and wet) sulfur deposition for TRNP in 2011 (as measured by the active TRNP-Painted Canyon station) was 1.3 kilograms per hectare per year (kg/ha/yr), and the total nitrogen deposition was 3.0 kg/ha/yr. For comparison, the 2009–2011 mean for the eastern United States was 5.3 kg/ha/yr, and for the western United States, 0.8 kg/ha/yr. In the western United States, total sulfur deposition has decreased 35% since 1996–1998, and total nitrogen deposition decreased 22% over a 16-year period (AMEC Environment & Infrastructure, Inc. 2013).

Nonattainment New Source Review

Nonattainment NSRs are required by Part D of Title I of the CAA applies to new major sources that might be sources of pollutants and to major modifications at existing sources of pollutants; these new and modified sources are defined as "not in attainment" with the NAAQS. Nonattainment NSR requirements are customized for the nonattainment area. All of North Dakota is currently in attainment, so the nonattainment NSR does not apply to the proposed project.

Final Federal Implementation Plan for Oil and Natural Gas True Minor Sources and Amendments to the Federal Indian Country Minor New Source Review Rule

On May 12, 2016, the EPA finalized a federal implementation plan to implement the agency's Indian Country Minor NSR program (EPA 2016). This plan limits emissions of harmful air pollutants while streamlining the preconstruction permitting process for the oil and natural gas industry. This plan will be used instead of source-specific minor NSR preconstruction permits in Indian country. It does not apply in areas designated as nonattainment for a NAAQS. Sources locating in nonattainment areas will have to seek a source-specific permit, or comply with reservation-specific FIPs where those exist. The EPA will consider whether to apply requirements of the FIP to true minor sources in specific nonattainment areas in the future.

Federal Implementation Plan

Pursuant to the CAA, the EPA promulgated the "Federal Implementation Plan for Oil and Natural Gas Production Facilities on the Fort Berthold Indian Reservation," which was published in the *Federal Register* on March 22, 2013 (EPA 2013). The FIP is a federal rule that applies only to oil and natural gas operations producing from the Bakken Pool on the FBIR. The FIP requires owners and operators of well production facilities for oil and natural gas to reduce emissions of VOCs from oil and natural gas well completions, recompletions, and production and storage operations that were performed on or after August 12, 2007.

There is no other federal rule that establishes regulations for the particular oil and natural gas production operations that exist on the FBIR. This is in contrast to oil and natural gas operations off the FBIR, which are governed by NDDH regulations and by the North Dakota Industrial Commission (EPA 2013).

Conformity Determination

The general conformity rule was created to ensure that actions by the federal government will neither cause nor aggravate a violation in air quality standards, nor delay timely attainment of standards. Section 176(c) of the CAA prohibits federal agencies from taking actions in nonattainment and maintenance areas unless the emissions from the actions conform to the implementation plan for the area. State or tribal implementation plans are EPA-approved plans that set forth the pollution-control requirements applicable to the various sources addressed by each implementation plan. Federal actions must be evaluated for conformity to the local state/tribal implementation plan if the proposed project 1) is located in an EPA-designated nonattainment or maintenance area, 2) would result in emissions above major source threshold quantities of criteria pollutants, 3) is not a listed exempt action, and 4) has not been accounted for in an EPA-approved state/tribal implementation plan.

The proposed project would not be located in a nonattainment or maintenance area, and the BIA is therefore not required to determine conformity.

3.3.1.3 Environmental Consequences

Proposed Project

Related to site preparation, activities that lead to pollutant emissions include construction activities such as compressor station foundation and access road grading and leveling, and subsequent vehicular traffic (from worker commute and equipment and material transport). Ground-moving activities during construction can create fugitive dust. Transportation of workers, materials, and equipment begins with initial surveys and continues for the life of the project. Vehicles can emit pollutants directly and by disturbing dust on paved or unpaved roadways.

The primary criteria pollutants from natural gas-fired reciprocating engines are NO_X, CO, and VOCs. The formation of nitrogen oxides is exponentially related to combustion temperature in the engine cylinder. The other pollutants, CO and VOC species, are primarily the result of incomplete combustion. PM emissions include trace amounts of metals, non-combustible inorganic material, and condensable, semi-volatile organics that result from volatized lubricating oil, engine wear, or from products of incomplete combustion (EPA 2017c). Additionally, compressor stations can be a potential source of CH_4 emissions. In 2012, EPA estimated that as many as 45% of CH_4 emissions in the natural gas transportation and storage sector were from traditional reciprocating compressors (the EPA estimated that the transportation and storage sector was responsible for 27% of overall methane emissions from the oil and gas industry).

The use of reciprocating engines for the compressor station could make the station a major source under the CAA (could release up to 100 tons/year of any air pollutant, 10 tons/year for HAP). Accordingly, operation of the compressor station may require a permit under Title V of the CAA which is for major sources of air pollutants or it may qualify for a permit under the Indian Country

NSR. As necessary, Targa will seek the appropriate permit from the EPA for the Blue Butte Compressor Station, which will include measures intended to minimize emissions associated with the operation of the compressor station. These measures may include installation of scrubbers and filters, mufflers, etc.

Because of the relatively small amount of emissions that a single compressor station would have, as well as the distance of this station from existing sensitive receptors, this project would have little to no impact on public health and safety and would cause no violations of any NAAQS.

3.4 Biological Resources

This section discusses the ecosystems, habitats, vegetation, and wildlife in the project area. The analysis areas vary among resources and are described below.

3.4.1 Habitats and Vegetation

Both aquatic and terrestrial habitats exist in the vicinity of the proposed project area.

3.4.1.1 Affected Environment

Aquatic Habitats

Aquatic habitats typically include wetlands and waters of the U.S. under the jurisdiction of the U.S. Army Corps of Engineers (USACE), as well as other aquatic areas that may not fall under their purview (non-jurisdictional) but still provide habitat for various species. A discussion of non-jurisdictional waterbodies and waterways (ponds, lakes, and streams) are included in Section 3.2.1, Surface Water.

Wetlands

Generally, wetlands are areas where water saturation is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface (Cowardin et al. 1979). Wetlands vary widely because of regional and local differences in soils, topography, climate, hydrology, water chemistry, vegetation, and other factors. To be classified as a wetland under federal definition, an area must meet three requisite criteria: 1) have a plant community dominated by hydrophytic vegetation, 2) contain wetland hydrology, and 3) be composed primarily of hydric soils. These criteria may be met if the area contains at least one primary indicator or two secondary indicators. Wetlands that meet all three criteria may be subject to regulation by the USACE under Section 404 of the CWA (33 CFR 1251 et seq.). The regulatory status of wetlands and other potential waters of the U.S. under the CWA is determined by the USACE and EPA.

Wetland types are classified by the USFWS, which maintains the National Wetlands Inventory (NWI) database. The NWI identifies wetland areas and categorizes them based primarily on aerial imagery interpretation. The USFWS developed its wetland classification system using the Cowardin classification of wetland and deepwater habitats (Cowardin et al. 1979).

The analysis area for wetlands extends beyond the immediate project area because of the ability for surface water runoff and groundwater connections to affect wetlands outside the project area. Therefore, the area within 0.5 mile around the project area is included in this analysis. The existing affected environment for wetlands and the potential impacts from the proposed project.

Palustrine Freshwater Emergent

Palustrine freshwater emergent (PEM) wetlands are characterized by erect, rooted, herbaceous aquatic plants, excluding mosses and lichens (Cowardin et al. 1979). These wetlands are usually dominated by perennial plants, which are present for most of the growing season. Agricultural activities such as hay production and livestock grazing are common in these wetland types. Dominant species in PEM wetlands may include meadow foxtail (*Alopecurus pratensis*), obligate or facultative wet sedges (*Carex* spp.), scratchgrass (*Muhlenbergia asperifolia*), cattails (*Typha* spp.), bluegrasses (*Poa* spp.), reed canarygrass (*Phalaris arundinacea*), and bulrushes (*Scirpus* spp.).

According to the USFWS NWI database, four PEM wetlands are located within 0.5 mile of the project area (Table 3.9, Figure 3.5). The proposed compressor station would be located approximately 0.07 mile from the nearest wetland classified as PEM. The NWI maps maintained by the USFWS do not identify any wetlands in the proposed compressor station or access road areas that would be filled or disturbed by the proposed project (USFWS 2016a). Additionally, no wetlands were observed in the project area during SWCA's field surveys conducted May 16, 2017. However, indirect impacts to wetlands could occur through site erosion and subsequent sedimentation of nearby wetland areas.

Table 3.9. Wetland Types within 0.5 Mile of the Project Area

Project Wetland # (correlated to wetland map if appropriate)	NWI Wetland Type	Size (acres)	Distance/Direction to Project Area (miles)
01	PEMA	0.098286	0.08 mile east
02	PEMA	0.098288	0.07 mile east-southeast
03	PEMA	0.098273	0.11 mile east
04	PEMC	3.438728	0.09 mile south

Note: PEMC= Plustrine Emergent Seasonal; PEMA= Plustrine Emergent Temporary

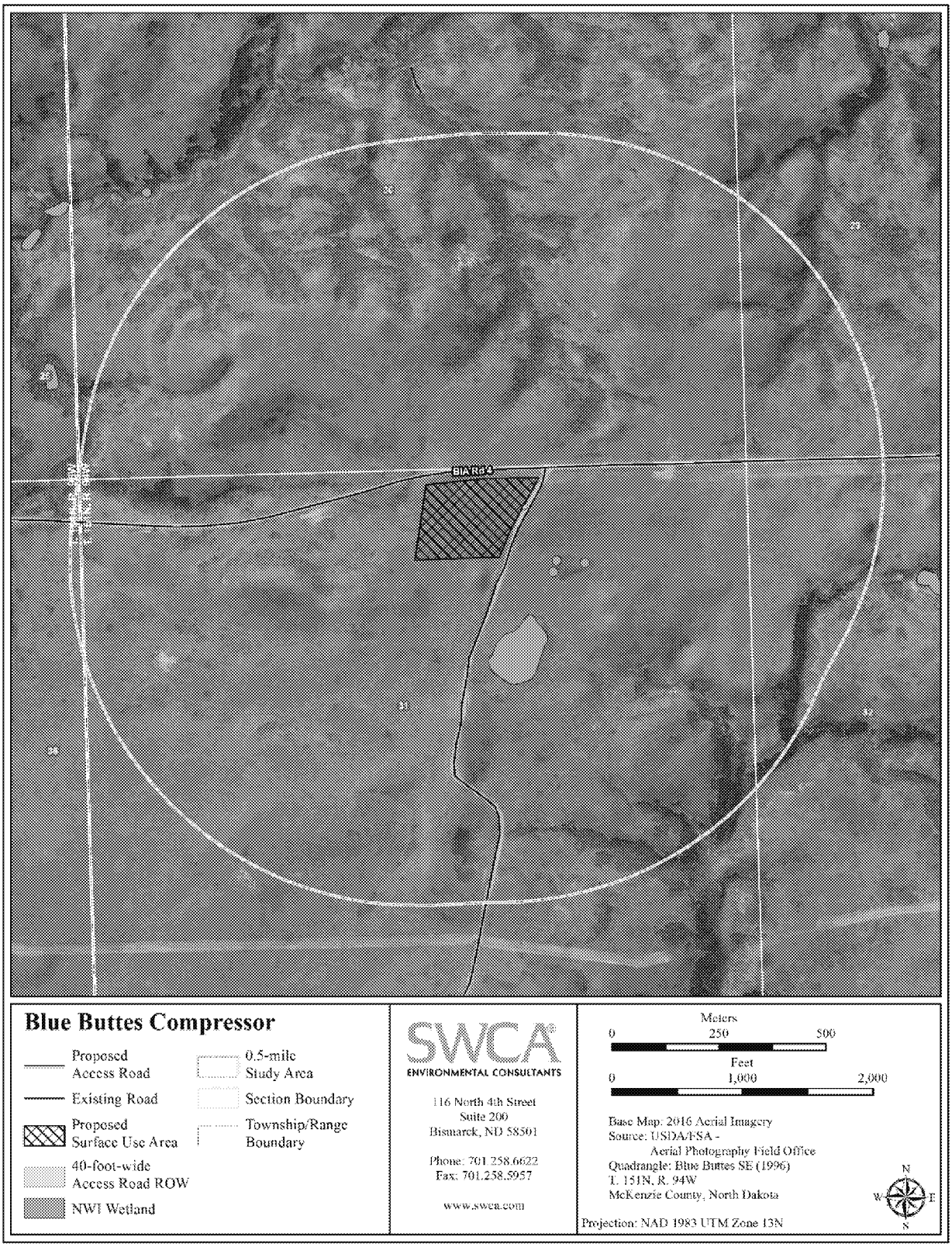

Figure 3.5. Wetlands within 0.5 mile of the project area.

Terrestrial Habitats

The analysis area for terrestrial habitats includes the project area areas adjacent to the project area. The proposed project area lies in the Missouri Plateau ecoregion (Missouri Slope), which is a western mixed-grass and short-grass prairie ecosystem (Bryce et al. 1998). Native grasses common to this ecoregion include big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), blue grama (*Bouteloua gracilis*), sideoats grama (*B. curtipendula*), green needlegrass (*Nassella viridula*), and western wheatgrass (*Pascopyrum smithii*). Common wetland vegetation in the region includes various sedge species, prairie cordgrass (*Spartina pectinata*), bulrush, and cattails. Common plant species found in woody draws, coulees, and drainages include chokecherry (*Prunus virginiana*), silver buffaloberry (*Shepherdia argentea*), and western snowberry (*Symphoricarpos occidentalis*).

Vegetation at the proposed location of the compressor station and access road is predominantly non-native upland mixed-grass (Figure 3.6 and Figure 3.7). Predominant vegetation noted in the project area includes Kentucky bluegrass (*Poa pratensis*), smooth brome (*Bromus inermis*), western snowberry (*Symphoricarpos* spp.), and Canada anemone (*Anemone canadensis*) with some native and non-native forbs intermixed.

Figure 3.6. Upland grass vegetation in the project area, view facing northwest. Photograph taken on May 16, 2017.

Figure 3.7. Upland vegetation in the project area, view facing northeast. Photograph taken on May 16, 2017.

Noxious Weeds

Noxious weed is a general term used to describe plant species that are not native to a given area, spread rapidly, and have adverse ecological and economic impacts. These species may have high reproduction rates and are usually adapted to occupy a diverse range of habitats otherwise occupied by native species. These species may subsequently outcompete native plant species for resources, causing a reduction in native plant populations.

Noxious weeds have the potential to detrimentally affect public health, ecological stability, and agricultural practices. North Dakota Century Code (Chapter 63-01.1) and the North Dakota Department of Agriculture (NDDA) recognize 11 species as noxious, as shown in Table 3.10 (NDDA 2016). In 2016, six state noxious weed species were found on 234 acres in McKenzie County (NDDA 2016). Each county has the authority to add additional species to its list of noxious weeds. McKenzie County added five additional species to its noxious weed list (NDDA 2017) (see Table 3.10). In 2016, four county-listed noxious weed species were found on 24.0 acres in McKenzie County (NDDA 2016).

The analysis area for noxious weeds is the project area. During the natural resource surveys, no state or county noxious weeds were observed in the project area.

Table 3.10. Noxious Weeds in McKenzie County, North Dakota

Common Name	Scientific Name	Acres in McKenzie County 2016
North Dakota Noxious Weeds		
Absinth wormwood	*Artemisia absinthium*	5
Canada thistle	*Cirsium arvense*	200
Dalmatian toadflax	*Linaria dalmatica*	1
Diffuse knapweed	*Centaurea diffusa*	0
Leafy spurge	*Euphorbia esula*	20
Musk thistle	*Carduus nutans*	2
Purple loosestrife	*Lythrum salicaria*	0
Russian knapweed	*Acroptilon repens*	0
Saltcedar	*Tamarix ramosissima*	0
Spotted knapweed	*Centaurea stoebe*	5
Yellow toadflax	*Linaria vulgaris*	1
Total		**234**
McKenzie County Noxious Weeds		
Baby's breath	*Gypsophila muralis*	3
Black henbane	*Hyoscyamus niger*	3
Common burdock	*Arctium minus*	7
Houndstongue	*Cynoglossum officinale*	8
Halogeton	*Halogeton glomeratus*	0
Total		**21**

Source: NDDA (2016).

3.4.1.2 Environmental Consequences

Proposed Project

Aquatic Habitats

No wetlands would be filled as part of the proposed project. Surface disturbance activities would be restricted to the areas described in Section 2.1.1 to avoid any disturbance of other nearby wetlands. To prevent any additional impacts to waterways, including Lake Sakakawea, and to prevent any indirect effects to wetlands that could result from construction, drilling, or production activities, Targa would employ standard BMPs and other site-specific erosion-control measures, as discussed in Section 2.1.2.2.

Terrestrial Habitats and Noxious Weeds

The proposed project would result in long-term loss of 10.13 acres of upland, non-native grassland vegetation and scattered trees described in the Terrestrial Habitats section of Section 3.4.1. Removal of existing vegetation could facilitate the spread of invasive species and adversely affect undisturbed grassland and other surrounding vegetation. Targa would control noxious weeds throughout the project area. If a noxious weed community is found, it would be eradicated unless the community is too large, in which case it would be controlled or contained to prevent further growth. The services of a qualified weed-control contractor would be used.

Surface disturbance and vehicular traffic would be restricted to the TAT approved areas for the compressor station and access road. Areas that are stripped of topsoil would be seeded and reclaimed at the earliest opportunity. Additionally, certified weed-free straw and certified "noxious weed-free" native grass seed would be used for all construction, seeding, and reclamation efforts. Prompt and appropriate construction, operation, and reclamation are expected to maintain minimal levels of adverse impacts to vegetation and would reduce the potential establishment of invasive vegetation species.

Rapid reclamation and the implementation of BMPs and applicant-committed measures as described in Section 2.1.2.2 would minimize any long-term loss of soil resources and degradation of vegetation in the project area. Construction of the proposed compressor station and access road would result in long-term disturbance of vegetation because these facilities would be only partially reclaimed and would be in continuous use for the life of the project. With implementation of BMPs and noxious weed management guidelines, described in Section 2.1.2, the proposed project would result in negligible levels of vegetation disturbance and no significant adverse impacts to vegetation resources.

3.4.2 Wildlife

The analysis area for wildlife resources extends beyond the immediate project area because of wildlife migration and the ability for surface water runoff to have a watershed level affect. Therefore, the analysis area for general wildlife and raptors is considered to be 0.5 mile (line of sight) around the project area. The analysis area for threatened and endangered species varies and is based on the distance to know populations, suitable habitat, or designated critical habitat for these species, as well as the area of habitat potentially affected by construction or operational noise.

3.4.2.1 Affected Environment

SWCA biologists conducted natural resources surveys for the proposed compressor station and access road on May 16, 2017. The surveys focused on general wildlife and plants and raptor nests and habitats; in addition, habitat assessments for threatened and endangered species were conducted. The surveys were completed to gather site-specific data and photographs for biological, botanical, soil, wetlands, and water resources. Raptor, eagle, and migratory bird habitat surveys were also conducted within a 0.5-mile line-of-sight of the project area.

General Wildlife

Several species common to the northern Great Plains include mule deer (*Odocoileus hemionus*), American badger (*Taxidea taxus*), eastern spotted skunk (*Spilogale putorius*), and grassland songbirds such as western meadowlark (*Sturnella neglecta*) and loggerhead shrike (*Lanius ludovicianus*).

Lake Sakakawea is known as the premier fishing destination in North Dakota, and fish stocking programs there are closely managed and highly productive. In addition, Lake Sakakawea is known nationwide for its trophy sport fishing, which supports recreation and economies in all reaches of the reservoir. The nearest point of Lake Sakakawea is 3.10 straight miles east of the project area.

Migrating waterfowl such as the Canada goose (*Branta canadensis*), American widgeon (*Anas americana*), mallard (*A. platyrhynchos*), ring-necked duck (*Aythya collaris*), snow goose (*Chen caerulescens*), and a multitude of other waterfowl use Lake Sakakawea during migration for forage and rest. Other seasonally resident and/or migratory avian species such as the great blue heron (*Ardea herodias*), American avocet (*Recurvirostra americana*), marbled godwit (*Limosa fedoa*), red-winged blackbird (*Agelaius phoeniceus*), and killdeer (*Charadrius vociferus*) are common residents on the shorelines and islands of Lake Sakakawea.

Threatened, Endangered, Candidate, Proposed, and Other Federally Protected Species

In McKenzie County, North Dakota, nine species are listed under the Endangered Species Act (ESA): gray wolf (*Canis lupus*), whooping crane, black-footed ferret (*Mustela nigripes*), piping plover (*Charadrius melodus*) and its designated critical habitat, interior least tern (*Sterna antillarum*), pallid sturgeon (*Scaphirhynchus albus*), Dakota skipper (*Hesperia dacotae*) and its designated critical habitat, rufa red knot (*Calidris canutus rufa*), and northern long-eared bat (*Myotis septentrionalis*).

The Bald and Golden Eagle Protection Act (BGEPA) (16 USC 668–668d, 54 Sta. 250) and the Migratory Bird Treaty Act of 1918 (MBTA) (916 USC 703–711) protect bald and golden eagles and their nests and nesting migratory bird species and their active nests (i.e., nests containing eggs or young), respectively.

Cropland near the project area may provide suitable foraging habitat for whooping cranes. Designated critical habitat for the piping plover is located on the shoreline and islands of Lake Sakakawea, approximately 3.10 straight line miles from the proposed project. Potential spills or erosion from the compressor station would have to travel 7.9 river miles before reaching piping plover designated critical habitat. Based on surveys conducted on May 16, 2017, the project area is dominated by upland, non-native grassland. The project area lacks requisite Dakota skipper grass and forb species were sparse. Thus, there is no suitable habitat for the Dakota skipper in the project area. Lake Sakakawea, located 3.10 straight line miles from the proposed project area, provides potential stopover habitat for rufa red knots during the migration season, but their presence in the area is believed to be rare. Additionally, although no pallid sturgeon habitat is located in the project area, they may be present in Lake Sakakawea, which is 7.9 river miles east of the project area.

The project area does not contain forested habitat necessary to provide connectivity to known populations of gray wolf in Minnesota and Manitoba. Additionally, black-footed ferrets are believed to be extirpated from North Dakota and the project area does not contain any complexes of prairie dogs (*Cynomys* sp.), their prey base. One woody vegetation area, was recorded within the project area. The woody vegetation area contained dogwood (*Cornus* spp.), green ash (*Fraxinus pennsylvanica*), buffaloberry (*Shepherdia* spp.), and chokecherry. No other northern long-eared bat habitat is present in the project area.

Surveys for species protected under the BGEPA and MBTA were also conducted. The non-native grass prairie habitat surrounding the project area provides suitable nesting habitat for many migratory bird species. Wetlands and riparian areas in nearby streams and along Lake Sakakawea also provide migratory bird nesting habitat. Suitable nesting habitat for eagles and raptors (mature trees) is present within 0.5 mile of the project area. However, no eagle nests or other raptor nests were observed by SWCA during the field surveys in May 2017. No wildlife was observed at or

near the project area during the field surveys. Migratory bird nesting habitat (grasslands) exists in the project area.

According to the North Dakota Game and Fish Department database of bald eagle nests, no known bald or golden eagle nests exist within 0.5 mile of the project area (North Dakota Game and Fish Department 2010). The closest known bald eagle nest is 2.08 miles northeast of the project area in the NE¼ SW¼ of Section 21, T151N, R94W (Carlson McCain, Inc. 2016). The location of this nest was observed to be inactive in 2015. The nearest known golden eagle nest is located 4.96 miles southeast in the NW¼ NE¼ of Section 22, T151N, R94W (Carlson McCain, Inc. 2016) and was also observed to be inactive in 2015.

3.4.2.2 Environmental Consequences

Proposed Project

General Wildlife

Minor impacts to unlisted wildlife species and their habitats could result from the construction of the compressor station and access road and increased vehicular traffic density and long-term disturbances during commercial production. Ground clearing may affect habitat for birds, mammals, and other wildlife species. The proposed project may affect raptor and migratory bird species through habitat degradation or displacement of individual birds. During construction, wildlife might avoid the area because of increased traffic and noise, but once construction is completed, this temporary impact would cease. Fragmentation of native prairie habitat can also detrimentally affect non-migratory birds managed by the state, such as grouse species; however, because of the ratio of the project area to the total landscape area, the overall disturbance would be negligible. In addition, the proposed project area was chosen to use existing infrastructure and to limit, to the extent possible, any additional fragmentation across the landscape. The compressor station would result in 10.13 acres that would no longer be available to grazing wildlife species; however, because of the large proportion of area available outside of the project for grazing wildlife, this would not be a significant impact.

The development of oil and gas resources, particularly the development of infrastructure and roads, can fragment habitats. Typical results of such fragmentation include smaller patch sizes, increased edge effects, and loss of genetic diversity from wildlife mobility reduction. Smaller patch sizes have shown to increase predation, parasitism, and decrease genetic density, all leading to low nesting success. Environmental changes from these developments usually occur over a period of many years and can be difficult to measure without baseline data. Potential direct impacts from the proposed project on the local wildlife and their habitats are expected to be minimal.

Threatened, Endangered, Candidate, Proposed, and Other Federally Protected Species

All species listed under the ESA and protected under BGEPA and MBTA for McKenzie County (USFWS 2016b) were reviewed to determine their status and potential occurrence in the project area and are described above in Section 3.4.2.1. No designated critical habitat is located within the project area and no adverse effects to any critical habitat would be expected a result of the proposed project.

Croplands near the project area may provide suitable foraging habitat for whooping cranes. Four PEM wetlands wetland are located within 0.5 mile of the proposed project activities. None of these wetlands would be filled as a result of project activities. Other similar habitats are available near the project area. However, project ground-disturbing activities would be temporary in nature. Therefore, adverse effects to whooping crane are not anticipated.

Lake Sakakawea, located 3.10 straight-line miles and 8.85 river miles east of the project area, provides suitable habitat for interior least tern, piping plover, and potentially for rufa red knot. The proposed project includes BMPs that reduce the likelihood of construction stormwater runoff entering waterways that could reach Lake Sakakawea. Because of the distance from suitable interior least tern, piping plover, and rufa red knot habitat on Lake Sakakawea and with implementation of BMPs, these species are not anticipated to be adversely affected by the proposed project. Lake Sakakawea also provides suitable habitat for pallid sturgeon; however, because of the distance of the proposed project from the lake and with implementation of BMPs, effects to pallid sturgeon are not anticipated.

The project area is predominantly non-native upland grasslands. The lack of requisite Dakota skipper grass and forb species indicates that suitable Dakota skipper habitat is not present in the project area. Therefore, no effects to Dakota skipper would be anticipated. Additionally, because of the lack of northern long-eared bat habitat, no adverse effects are anticipated to this species.

Bald Eagle

Suitable nesting or foraging habitat for bald eagles includes old growth trees relatively close (usually less than 1.24 miles [Hagen et al. 2005]) to perennial waterbodies. The project area does not contain old growth trees; however, the proposed compressor station would be 3.10 straight-line miles from a perennial waterbody, Lake Sakakawea. No eagles or nests were observed within 0.5 mile of the proposed project area during the field survey, although eagle nesting habitat does exist within 0.5 mile of the project area. A 0.5-mile buffer would be maintained around all known or newly discovered bald eagle nests. Therefore, no unauthorized incidental take of bald eagles is anticipated.

Golden Eagle

No golden eagles or nests were observed during the field surveys; however, golden eagles may exist in or near the project area. The golden eagle prefers habitat characterized by open prairie, plains, and forested areas. Usually, golden eagles can be found near badland cliffs, which provide suitable nesting habitat. The closest known golden eagle nest is approximately 2 miles from the project. However, eagle nesting habitat is present within 0.5 mile of the project area. A 0.5-mile buffer would be maintained around all known or newly discovered golden eagle nests. As a result, no unauthorized incidental take of golden eagles is anticipated.

Migratory Birds

Suitable habitat for migratory grassland birds exists in the project area. Suitable nesting habitat for raptors was observed within 0.5 mile of the project area. At the proposed project location, the following migratory bird protective measures would be implemented.

1. Schedule construction for late summer, fall, or early winter so as not to disrupt waterfowl or other migratory birds during the breeding season (February 1–July 15).
2. If the construction window in item 1 above cannot be honored, degrade migratory bird habitat at the project site outside of the breeding season (July 16–January 31) by mowing or clearing and grubbing to discourage nesting, and maintain the habitat in a degraded state until construction is complete.
3. If construction occurs within the migratory bird nesting season without habitat degradation, conduct surveys at the well pad and access road for migratory birds and their active nests (nests containing eggs or young) within 5 days of commencement of construction activities. If active migratory bird nests are found during surveys, contact the USFWS and TAT with a proposal for realigning the work or maintaining adequate buffers to prevent the take of migratory birds.

Compliance with measures to protect migratory birds and their active nests during their nesting season would ensure no unauthorized incidental take would result from the proposed project.

3.5 Cultural Resources

The analysis area for cultural resources is the project area.

3.5.1 Historic and Archaeological Resources

3.5.1.1 Affected Environment

Historic properties, or cultural resources, on federal or tribal lands are protected by many laws, regulations, and agreements. For example, Section 106 of the National Historic Preservation Act of 1966 (16 USC 470 et seq. [and its implementing regulations, 36 CFR 800]) requires, for any federal, federally assisted, or federally licensed undertaking, that the federal agency take into account the effects of that undertaking on any property that is included in the NRHP before the expenditure of any federal funds or the issuance of any federal license. The broad term *cultural resources* encompasses sites, objects, and historical, cultural, and religious practices. Eligibility criteria (36 CFR 60.4) include association with important events or people in our history, distinctive construction or artistic characteristics, and a record of yielding or a potential to yield important information. In practice, properties that lack diagnostic artifacts, subsurface remains, or structural features are generally not eligible for the NRHP, but those considered eligible are treated as though they have been listed on the NRHP even when no formal nomination has been filed.

Whatever the nature of the cultural resources addressed by a particular statute or tradition, implementing procedures invariably include consultation requirements at various stages of a tribal undertaking. The MHA Nation has designated a THPO by Tribal Council resolution; the THPO's office and functions are certified by the National Park Service. Therefore, the MHA Nation consults and corresponds with the THPO regarding cultural resources on all projects proposed within the exterior boundaries of the FBIR.

3.5.1.2 Environmental Consequences

Proposed Project

No historic or archaeological resources are located in the defined area of potential effects. Therefore, no effects to historic or archaeological resources would occur as a result of the proposed project.

3.5.2 Cultural, Sacred, and Traditional Cultural Properties

The area of potential effects of any federal undertaking must also be evaluated for significance to Native Americans from a cultural and religious standpoint. A representative for the THPO was invited but could not attend the inventory. Results of the inventory were emailed to the TAT Tribal Historic Preservation Office on May 25, 2017.

3.5.2.1 Affected Environment

SWCA conducted a Class I and Class III cultural resources inventory using an intensive pedestrian methodology on May 10 and 16, 2017, respectively, for the proposed compressor station within the exterior boundaries of the FBIR in McKenzie County (Schleicher 2017).

The Class III inventory covered a 35.68-acre block survey centered on the proposed 10.13-acre compressor station. The proposed access road was fully contained within the block survey area. A Portions of the inventory area were previously inventoried (Baer and Retter 2011; Macy 2011). The current inventory includes 26.88 non-overlapping acres to ensure adequate coverage. As proposed, the compressor station and access road would be fully located within inventoried areas, both previous and current (Baer and Retter 2011; Macy 2011).

During the inventory, two cultural resources were identified, which remain unevaluated with regards to their NRHP eligibility. Through project design, the proposed compressor station and access road will avoid both sites by over 150 feet. Because of the adequate avoidance, no further work is recommended.

3.5.2.2 Environmental Consequences

Proposed Project

The results of the inventory were sent to the THPO on May 26, 2017. If cultural resources are discovered during construction or operation of the proposed project, the operator would immediately stop work, secure the affected site, and notify the THPO. Unexpected or inadvertent discoveries of cultural resources or human remains would trigger mandatory federal procedures that include work stoppage and THPO consultation with all appropriate parties. Following any such discovery, operations would not resume without written authorization from the THPO. Project personnel would be prohibited from collecting any artifacts or disturbing cultural resources in the area under any circumstance. Workers who step outside the ROW would be considered trespassers.

3.6 Socioeconomics

This section discusses community characteristics such as employment, income, population, demographics, housing, lifestyle, community infrastructure, and economic trends within the socioeconomic analysis area. These local data are compared to information for the state of North Dakota and the United States for context. Environmental justice impacts are analyzed at the end of this section. Information in this section was obtained from various sources, including the U.S. Census Bureau, the U.S. Bureau of Economics, and the North Dakota State Government.

The geographic scope of analysis for social and economic impacts (the socioeconomic analysis area) consists of the FBIR and four North Dakota counties: McKenzie, Dunn, McLean, and Mountrail. These counties were included in the analysis area because of their proximity to the project area and because they overlap the FBIR.

3.6.1.1 Affected Environment

Employment

The economy in North Dakota, including the FBIR and four counties in the analysis area, has historically depended on agriculture, grazing, and farming as key industry sectors for employment. Although the agriculture sector represents only 9% of employment in North Dakota, it accounts for 29% of employment in Dunn County, 25% in McKenzie County, 22% in McLean County, 20% in Mountrail County, and 13% on the FBIR (Headwaters Economics 2012). Retail trade did not represent a significant amount of employment in the analysis area in 2010; however, energy development and extraction, power generation, and services related to these activities have become increasingly important over the past several years, and many service-sector jobs are directly and indirectly associated with oil and gas development.

In June 2013, total employment in North Dakota was 415,263, and the statewide unemployment rate was 3.8% (Table 3.11) (Bureau of Labor Statistics 2013). With the exception of McLean County, unemployment rates in analysis area counties were lower than the state average during the same period.

Table 3.11. Total Employment, Average Weekly Wages, and Unemployment Rates for the Analysis Area, North Dakota, and the United States

Location	Total Employment (June 2013)	Average Weekly Wage (Q1 2013)	Unemployment Rate (June 2013)	Change in Unemployment Rate (2009–2013)
United States	132,327,062	$989	9.4%	+4.3%
North Dakota	415,263	$885	3.8%	+0.4%
Dunn County	3,894	$1,314	1.5%	-0.1%
McKenzie County	7,146	$1,266	1.5%	-1.1%
McLean County	4,221	$875	4.5%	-1.2%
Mountrail County	7,381	$1,165	1.9%	-3.6%
FBIR	2,466 (2010)	N/A	44.1% (2010)	-26.9% (when comparing 2005 to 2010)

Sources: BIA (2005, 2014a); Bureau of Labor Statistics (2013); Economic Research Service (2010).

Note: In 2010, a total of 4,411 residents of the FBIR constituted the total available workforce, which is composed of individuals over 16 years old. At 44.1%, unemployment on the FBIR was the highest in the analysis area (BIA 2014a).

Residents of the FBIR are employed in industries similar to those outside the FBIR. Typical employment includes ranching, farming, tribal government, tribal enterprises, schools, federal agencies, and, recently, employment related to conventional energy development. The MHA Nation's Four Bears Casino and Lodge, located 4 miles west of New Town, employs approximately 320 people, of which 90% are tribal members (Fort Berthold Housing Authority 2008).

The Fort Berthold Community College, which is tribally chartered to meet the higher education needs of the people of the MHA Nation, had 11 full-time faculty members and 25 adjunct faculty members during the 2006–2007 academic year. Approximately 73% of the full-time faculty members are of American Indian/Alaska Native descent, approximately 88% of which are enrolled members of the MHA Nation. Additionally, 65% of the part-time faculty members are of American Indian/Alaska Native descent, and all (100%) are tribal members.

In 2012, the TAT Council established an employment rights office and passed a TERO ordinance and regulations (TERO 2012). The purpose of the TERO is "to increase employment of Indian workers and businesses and to eradicate employment discrimination within the exterior boundaries of the Fort Berthold Reservation" (TERO 2012:1). The TAT TERO ordinance and regulations require private employers conducting work on the FBIR to give preference to qualified Indians, with the first preference to local Indians, in hiring, promoting, training, and all other aspects of employment. The TERO office certifies Indian-owned businesses, monitors compliance with the TERO ordinance and regulations, establishes and collects fees, and provides specialized training to enrolled members of recognized Tribal nations and their spouses, among other duties.

The TERO ordinance and regulations also require that contracts or subcontracts for supplies, services, labor, and materials of $5,000 or more, where most of the work will occur within the FBIR, give preference to qualified firms that are certified by the TERO as 51% or more Indian owned and controlled (TERO 2012:7).

Income

Per capita income, median household income, and poverty rates for the analysis area and North Dakota are presented in Table 3.12. All four counties in the analysis area reported a per capita income in 2012 that was 3% to 57% greater than the North Dakota state average, and median household income varied from 4% less to 26% higher than the North Dakota state average. In comparison, FBIR residents had per capita incomes and median household incomes 67% and 24%, respectively, below the statewide average.

Table 3.12. Income and Poverty in the Analysis Area, North Dakota, and the United States

Unit of Analysis	Per Capita Income (2000)	Per Capita Income (2012)	Median Household Income (2012)	% of All People in Poverty (2000)	% of All People in Poverty (2012)
Dunn County	$20,973	$86,205	$62,424	13.3	10.1
McKenzie County	$22,238	$82,171	$67,995	15.7	11.3
McLean County	$22,768	$56,568	$52,548	12.3	10.5
Mountrail County	$22,968	$83,320	$59,583	15.7	11.6
FBIR	$8,855	$18,059* (2010 Census)	$41,658 (2010 Census)	38.0 (includes tribal members on and off the FBIR)	26.0 (2010 Census)
North Dakota	$25,592	$54,871	$54,579	10.4	11.2
United States	$29,676	$27,915	$52,762	12.2	15.9

Sources: Bishaw (2013); Economic Research Service (2010, 2011); Fort Berthold Housing Authority (2008); U.S. Census Bureau (2013a); U.S. Bureau of Economic Analysis (2013).

The poverty threshold is based upon median household incomes below $23,624 (for a family of four).

All analyzed counties, the FBIR, and North Dakota showed a substantial increase in per capita income (see Table 3.12) between 2000 and 2012, largely because of oil and gas development. However, although per capita income on the FBIR increased 104% between the 2000 Census and the 2010 Census, it was still 21% to 32% lower than that of the four counties in the analysis area and the state.

Poverty rate data for the analysis area are summarized in Table 3.12. Approximately 10% to 12% of households in Dunn, McKenzie, McLean, and Mountrail Counties were below the poverty threshold in 2012, whereas 26% of FBIR households were below the poverty threshold. Poverty rates decreased 15% to 32% in the analysis area between 2000 and 2012. In comparison, the poverty rate for the state of North Dakota increased by 8% during the same period.

Population and Demographic Trends

Historic and current population counts for the analysis area and the state are provided below in Table 3.13. The state population showed little change between 1990 and 2000; however, in 2010 the state population increased by 2.7% to 659,858 (Headwaters Economics 2012). Since 2000, populations in McKenzie and Mountrail Counties have increased 10.3% and 14.6%, respectively, whereas McLean and Dunn County populations declined by 3.8% and 1.8%, respectively (Headwaters Economics 2012). The population on the FBIR increased approximately 4.2% between 2000 and 2010 (Headwaters Economics 2012).

Table 3.13. Population and Demographic Trends in the Analysis Area and North Dakota

County or Reservation	Population in 2010	% State Population	% Change 1990–2000	% Change 2000–2010	Predominant Group in 2010 (% of Total Population)	Predominant Minority in 2010 (% of Total Population)
Dunn County	3,536	0.54	-10.1	-1.8	Caucasian (84.9)	American Indian (12.7)
McKenzie County	6,360	0.96	-10.1	10.3	Caucasian (75.3)	American Indian (22.2)
McLean County	8,962	1.36	-11.0	-3.8	Caucasian (91.0)	American Indian (7.0)
Mountrail County	7,673	1.16	-5.6	14.6	Caucasian (65.6)	American Indian (30.6)
FBIR	6,162	0.93	178.0*	4.2	American Indian (63.0)	American Indian (63.0)
North Dakota	659,858	100.00	0.5	2.71	Caucasian (90.5)	American Indian (5.3)

Sources: Headwaters Economics (2012); U.S. Census Bureau (2013a).

* Reflects percentage change between 1991 and 2001 (BIA 2001).

Housing

Housing in Dunn, McKenzie, McLean, and Mountrail Counties consists primarily of single, detached homes and mobile homes. The Fort Berthold Housing Authority manages most of the housing units on the FBIR. Housing typically consists of mutual-help homes built through various government programs, low-rent housing units, and scattered-site homes.

Table 3.14 provides housing-unit supply estimates for the analysis area. Overall, the number of owner-occupied units increased between 2000 and 2010, except in McLean County. The number of renter-occupied units also increased between 2000 and 2010, except in Dunn County. Approximately 18% to 38% of the counties' housing units were vacant in 2010, whereas 36% of FBIR housing units were vacant during the same period. In comparison, North Dakota housing vacancy was 12% in 2010 (Headwaters Economics 2012).

Most rental housing and homes available for private purchase in the analysis area are located in New Town. However, over the past 12 years, new housing construction has increased in much of the analysis area. New building permits issued in 2012 increased substantially over 2005 permit numbers (Table 3.15) (Headwaters Economics 2012; U.S. Census Bureau 2011). The median rent for analysis area counties also increased by up to 94% from 2000 to 2012 (Table 3.16) (U.S. Census Bureau 2013b).

Table 3.14. Housing Data for the Analysis Area and North Dakota

Region	Housing Units						Total Housing Units		% Change in Total (2000–2010)
	Owner Occupied		Renter Occupied		Vacant				
	2000	2010	2000	2010	2000	2010	2000	2010	
Dunn County	1,102	1,119	276	199	587	799	1,965	2,117	+7.74
McKenzie County	1,589	1,687	562	781	568	551	2,719	3,019	+11.03
McLean County	3,135	3,123	680	814	1,449	1,591	5,264	5,528	+5.02
Mountrail County	1,859	2,065	701	786	878	1,098	3,438	3,949	+14.86
FBIR	1,122	1,157	786	975	973	1,190	2,881	3,322	+15.31
North Dakota	171,299	184,117	85,853	92,525	32,525	36,219	289,677	312,861	+8.00

Sources: Headwaters Economics (2012); U.S. Census Bureau (2011).

Table 3.15. Housing Development Data for the Four Counties in the Analysis Area, 2005 to 2012

County	New Building Permits	
	2005	2012
Dunn County	4	46
McKenzie County	1	71
McLean County	20	92
Mountrail County	19	90

Source: U.S. Census Bureau (2013b).

Table 3.16. Rent Data for the Four Counties in the Analysis Area, 2000 to 2012

County	2000 Median Rent	2012 Median Rent
Dunn County	$231	$448
McKenzie County	$274	$470
McLean County	$291	$463
Mountrail County	$337	$547

Sources: U.S. Census Bureau (2016a, 2016b).

Lifestyle and Cultural Values

The current lifestyle and cultural values in the analysis area counties are mostly reflective of an agricultural and rural lifestyle, although increasing oil and gas development has, in some cases, influenced residents' lifestyles and values. As noted in the *Final Environmental Impact Statement for the Mandan, Hidatsa, and Arikara Nation's Proposed Clean Fuels Refinery,* "there is a perception among some individuals that other energy-related industrial activities may be

incompatible with maintaining the quality of the natural environment. Other people, however, in the area support industrial development for its positive economic effects" (BIA and EPA 2009:3-104).

MHA Nation members are from three separate tribes and have distinct cultural values, but they also share some overall lifestyle and cultural values. Tribal sovereignty and self-determination are important to the MHA Nation, as are economic development and environmental protection. Social issues on the FBIR are similar to those of many reservations, including high levels of unemployment, poverty, and certain types of health issues. The current status of factors that affect lifestyles and cultural values is discussed in the following subsections:

- All Socioeconomics subsections: Employment; Income; Population and Demographic Trends; Housing; Community Infrastructure, Public Utilities, and Services; and Environmental Justice
- Historic and Archaeological Resources (Section 3.5.1)
- Recreation (Section 3.7.1.1) and Transportation Networks (Section 3.7.1.3)
- Noise and Light (Section 3.8.1.1), Visual (Section 3.8.1.2), and Public Health and Safety (Section 3.8.1.3)

Community Infrastructure, Public Utilities, and Services

Community infrastructure and public services and utilities in the analysis area are provided by various levels of government. These public infrastructure and services include the following:

- Law enforcement, emergency response (fire and ambulance), and emergency medical services
- Medical services
- Public utilities such as electricity, water, wastewater, and solid waste
- Public education

Law enforcement in the analysis area is provided by the MHA Nation, county sheriffs' departments, and the North Dakota Highway Patrol. MHA Nation law enforcement does not have jurisdictional authority over non-tribal members. Much of the analysis area is remote enough that county and state law enforcement cannot quickly access it, especially areas of the FBIR. To address traffic safety, the MHA Nation recently passed a Civil Motor Vehicle Code that 1) adopted the North Dakota traffic laws, including fines and penalties, and 2) granted tribal law enforcement officers the ability to detain persons committing criminal offenses on the FBIR until they can be transferred to the appropriate agency with criminal jurisdictional authority (MHA Nation 2011).

Emergency fire, ambulance, and medical services in the analysis area are provided by the MHA Nation and the major communities in the four counties of the analysis area. As with law enforcement services, access to remote parts of the analysis area can be time consuming because of the travel distances and the conditions of the roads.

Public utilities (water, wastewater, and solid waste) are also provided by the tribe and communities within the four counties of the analysis area. The communities of New Town and Parshall sell freshwater to oil and gas operators for use in the drilling and completion phases. Wastewater

collection, treatment, and disposal on the FBIR are generally accomplished by septic systems in rural areas and by centralized collection and lagoon treatment systems in communities such as New Town and Parshall. Electrical services in the analysis area are provided by publically owned electric cooperatives: McKenzie, Roughrider, McLean, and Mountrail-Williams. At this time, electrical services do not extend to the most rural and remote parts of the analysis area.

Fort Berthold Community College and five public school districts are in the analysis area. All but one of the school districts serves kindergarten through twelfth-grade students.

Under the tax agreement between the MHA Nation and the state, the tribe would receive half of the 11.5% maximum oil production and extraction tax. The agreement states that a minimum 10% of the tribe's tax revenue would be spent on FBIR infrastructure projects, and the tribe would provide an annual report to the state detailing these expenditures. This agreement also clarifies that the tribe would receive a one-time $100,000 fee per well; this fee includes the TERO and tribal application fees (TAT and State of North Dakota 2013).

Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*, signed in 1994 by President Clinton, requires that federal agencies advance environmental justice by pursuing fair treatment and meaningful involvement of minority and low-income populations. Fair treatment means such groups should not bear a disproportionately high share of negative environmental consequences from federal programs, policies, decisions, or operations. Meaningful involvement means that federal officials actively promote opportunities for public participation and that federal decisions can be materially affected by participating groups and individuals.

The analysis area for environmental justice consists of the part of the FBIR in McKenzie County where the compressor station would be constructed and neighboring Dunn and Mountrail Counties, the latter of which contains the city of New Town, where project workers would likely live. Demographic data from the 2014 U.S. Census Bureau's American Community Survey 5-Year Estimates is used to determine whether populations protected by Executive Order 12898 are present in the analysis area. Demographic data for North Dakota is also provided for comparison purposes. Specific demographic data for the portion of the FBIR in Dunn County are not available. Based on available demographic data, the analysis area contains both minority and low-income populations. In some cases, individuals may fall into both categories. Table 3.17 summarizes relevant data regarding minority populations for the analysis area (U.S. Census Bureau 2016c).

Table 3.17. Minority Population and Poverty Rates for the Analysis Area and North Dakota, 2010 to 2014

	FBIR (McKenzie County)	McKenzie County	Dunn County	Mountrail County	North Dakota
Total Population	1,577	8,333	3,965	8,743	704,925
Percent Minority Population	95% (1,504)	24% (1,968)	17% (675)	35% (3,101)	12% (86,467)
Percent Population Below Poverty Line	44.8%	14.6%	11.5%	12%	11.9%

Source: U.S. Census Bureau (2016c).

3.6.1.2 Environmental Consequences

Proposed Project

Implementation of the proposed project would assists in the MHA Nation's ability to pursue economic development opportunities in keeping with its tribal sovereignty. In addition, the project may provide construction jobs and income to residents of the FBIR as well as Dunn, McKenzie, McLean, and Mountrail Counties. Impacts from operation would occur for the lifetime of the compressor station, which could be well over 30 to 70 years or more depending on the continued productivity of wells in the area. The proposed project could also affect population, availability of housing, lifestyles, public service demand, and environmental justice populations. These effects are discussed in the sections that follow.

Employment

Temporary construction jobs would be created for the compressor station and access road. Long-term operation would full-time employees and this may be fulfilled by existing or new staff.

Unemployment rates for 2010 (see Table 3.11) indicate that a workforce adequate for supporting the proposed project is available in the analysis area. Targa would work with the TAT TERO to ensure that the company complies with the requirements of the TERO ordinance and regulations. As a result, employment associated with well construction and production could have a beneficial effect on unemployment rates in the analysis area and increase the employment of TAT members and certified Native American companies.

Income

Salaries provided to hired workers could increase per capita income during the construction period for people who were previously unemployed or underemployed. Spending by contractors and workers for materials, supplies, food, and lodging in the analysis area, which would be subject to sales and lodging taxes, would also directly increase revenue and taxes on the FBIR and in nearby counties for the duration of construction activities.

Revenue and jobs from additional spending in the local area by businesses and individuals who would earn wages from construction activity could indirectly improve local economic conditions.

Other state, local, and FBIR taxes and fees would be incurred as a result of the proposed project with a percentage of these revenues distributed back to the local economies, including to the MHA Nation.

Population and Demographic Trends

The proposed project would be unlikely to result in any measurable population increases in the analysis area. Employment-related increases from the proposed project would represent less than a 1% increase in the population in the analysis area (more than 30,000 residents in 2010) (see Table 3.13). Additionally, although it is possible that job seekers from other localities could relocate to the area in search of employment, existing industry expertise and services in the analysis area are generally adequate to support additional oil and gas development.

Housing

The number of vacant properties in the analysis area as of 2010 (see Table 3.14) indicates that adequate housing exists for workers associated with the proposed project. However, median rents have continued to rise. Therefore, workers who do not own their housing could be subject to high rental rates during the construction period.

Lifestyle and Cultural Values

The following sections discuss the impacts to resources that are integral to area lifestyle and cultural values.

- All Socioeconomics subsections: Employment; Income; Population and Demographic Trends; Housing; Community Infrastructure, Public Utilities, and Services; and Environmental Justice
- Historic and Archaeological Resources (Section 3.5.1)
- Recreation (Section 3.7.1.1) and Transportation Networks (Section 3.7.1.3)
- Noise and Light (Section 3.8.1.1), Visual (Section 3.8.1.2), and Public Health and Safety (Section 3.8.1.3)

Community Infrastructure, Public Utilities, and Services

Employment-related increases from the proposed project would represent a population increase of less than 1%, which would not likely increase the demand for services or infrastructure on the FBIR or in the communities near the project area.

Water used during the construction phase would be obtained from a commercial source. Human and solid waste generated by proposed project would be periodically trucked from the project site to the nearest state-approved solid waste facility, where it would be properly disposed of.

Environmental Justice

Development of the compressor station may provide modest economic benefits to minority or low-income residents that may be hired as part of the construction crew or holding surface or mineral

interests in the project area as the compressor station would help to facilitate ongoing well development. Because most economic benefits would occur during the construction period and because the contribution of these benefits would be small relative to the economy of the analysis area.

Development of the compressor station and access road could disturb traditional cultural properties and cultural resources during construction. Project effects would be minimized or avoided through cultural surveys of proposed area of disturbance and through mitigation measures, including an immediate work stoppage requirement following unexpected discoveries of cultural resources of any kind. Given the limited potential for significant effects to historical or cultural sites that are valued by the tribes or tribal members, there would not be a disproportionate effect to environmental justice populations.

The proposed project would not result in significant impact to any other critical element, including air quality, public health and safety, transportation, water quality, wetlands, wildlife, soils, or vegetation. Therefore, no disproportionate effect to environmental justice populations would occur.

3.7 Resource Use Patterns

Resource use patterns that were analyzed include recreation, mineral extraction, and transportation networks.

3.7.1 Affected Environment

3.7.1.1 Recreation

Hunting (big game, small game, and furbearer) and fishing are available on the FBIR for tribal members and non-member residents with a license from the TAT Fish and Wildlife Division. Other outdoor recreation includes hiking, camping, boating, and wildlife viewing. Recreation on the FBIR is concentrated along Lake Sakakawea at Four Bears State Park, Antelope Creek State Game Management Area, the Van Hook State Game Management Areas, Deepwater Creek State Game Management Area, and Beaver Creek State Game Management Area, which are open to the public. Noise, human presence, increased traffic, and associated activities may affect the recreational setting near the project area. Therefore, the analysis area consists of recreational areas listed above.

3.7.1.2 Mineral Extraction

Ownership of mineral estates on the FBIR is diverse and includes tribal, federal, state, and private lands. The Bakken Formation under the FBIR is considered to be one of the largest oil-producing formations in the lower 48 states, and the BIA who holds the majority of the surface rights on the FBIR in trust has approved more than 1,700 oil and gas leases (BIA 2014b). The analysis area for mineral extraction is the Bakken Formation under the FBIR.

As of July 2016, there were 1,465 active wells and 539 permitted wells on the FBIR (North Dakota Industrial Commission 2017). These wells are extracting approximately 164,553 barrels of oil per day (North Dakota Industrial Commission 2017). The compressor station would assist in facilitating continued mineral extraction on the FBIR as part of the pipeline system.

3.7.1.3 Transportation Networks

Transportation around the project area predominantly occurs by private automobiles and commercial trucks on a network of state highways, county roads, and BIA routes. The analysis area for transportation includes the network of state highways, county roads, and BIA routes that would be traveled to access the project area.

Major federal highways surrounding the project area include U.S. Highway 2, which is an east-west route north of the FBIR; U.S. Highway 83, a north-south route east of the FBIR; and U.S. Highway 85, a north-south route west of the proposed project area. Interstate 94 south of the FBIR and project area provides access to Bismarck and other interstate transportation links. Federal highways outside FBIR boundaries are built and maintained through Federal Highway Administration and North Dakota Department of Transportation (NDDOT) funding and guidelines.

In addition to serving as the FBIR's main north-south route and providing access to the town of Mandaree, State Highway 22 is designated by North Dakota Parks and Recreation as part of the Killdeer Mountain Four Bears Scenic Byway, known for its scenic, cultural, and historical importance to North Dakota (North Dakota Parks and Recreation 2011a). The North Dakota Scenic Byways and Backways Program encourages all development projects within the immediate and distant viewshed of State Highway 22 to conserve the visual and aesthetic quality of the area (North Dakota Parks and Recreation 2011b). Main access to the proposed well pad sites are described below.

The primary transportation link to the compressor station would be from State Highway 22. The proposed compressor station site is approximately 1.03 miles west of Highway 22 and accessible from BIA Road 4 (Figure 3.8).

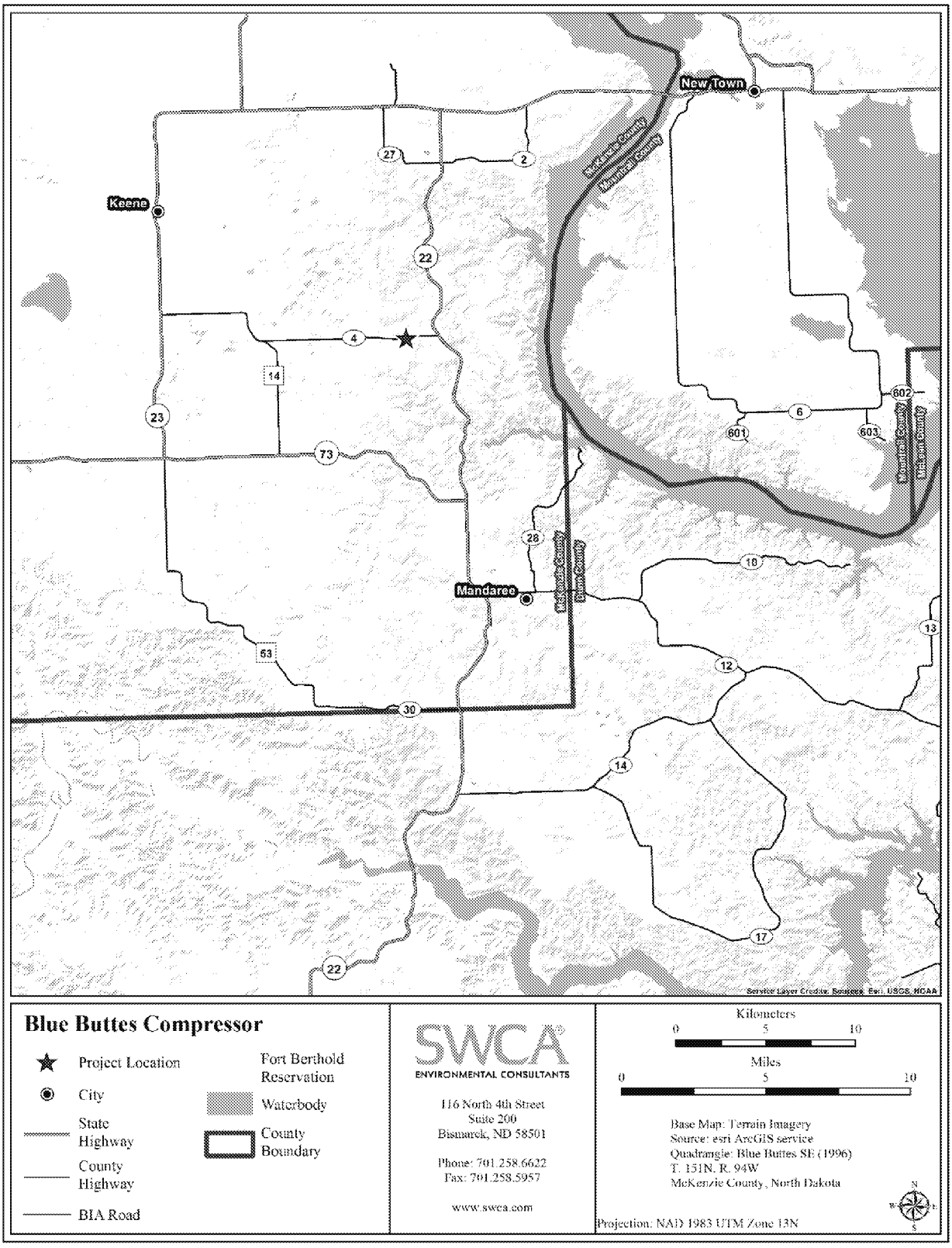

Figure 3.8. FBIR major roads and highways.

3.7.2 Environmental Consequences

3.7.2.1 Proposed Project

Recreation

Noise, human presence, increased traffic, and associated activities may affect the recreational setting near the project area. Habitat disturbance and activity during well development could affect the number and distribution of game species in the area and the quality of the hunting experience. Implementation of the proposed project could have a minor effect on fishing in Lake Sakakawea, which is approximately 3.10 straight-line miles east of the project area. However, based on the distance and the availability of other areas on the lake for fishing, these would be minor effects most readily apparent during the construction phase. Impacts to recreation would decrease after the construction phase, as human activity and traffic decrease around eh compressor station.

Mineral Extraction

The proposed project is to construct a compressor station and access road to facilitate continued oil and gas development on TAT land and would be consistent with ongoing and planned mineral extraction on the FBIR.

Transportation Networks

Transportation impacts could include increased traffic volumes on primary and secondary highways as well as resource and collector roads, an increased need for maintenance of existing roadways, and an increase in two-track and off-road vehicle travel. The NDDOT vehicle accident data for the FBIR do not necessarily indicate that there would be an increase in vehicle accidents and livestock/wildlife-vehicle collisions correlated with a temporary increase in average daily traffic due to project activities. However, road surface condition and construction could be affected by the addition of many heavy loads associated with construction activities.

Implementation of the proposed project would add new traffic volume to State Highway 22 and BIA Road 4, which is adjacent to the compressor station. New traffic would use the access road that Targa proposes to construct, improve, and maintain. This roadway would be 29 feet long and would permanently disturb approximately 0.03 acre of land. Potential short-term impacts from added traffic would occur during construction. Traffic associated with maintenance and would decrease during production. The compressor station would receive regularly scheduled inspection and maintenance, but would not require a regular workforce.

As outlined in Section 2.1.1.6 and Section 2.1.2.1, transportation has been planned to reduce vehicle density, avoid travel during wet conditions that would reduce excessive rutting that could result in additional road maintenance. Speed limits would be posted on roads to increase safety. SCADA systems would minimize the need for personnel to drive to the compressor station for monitoring during the operation phase. The expected level of added road use may be inconvenient to the residents living near the project area during construction but would be unlikely to result in serious road degradation or other long-term impacts on traffic.

Cooperative efforts by operators, agencies, and the tribe are currently being developed and implemented across the FBIR. Construction personnel are to stay within the ROW or follow designated access roads. By increasing pipeline infrastructure to which the proposed project contributes), centralizing water depots, and developing saltwater-disposal wells, overall truck traffic and road degradation would be reduced.

3.8 Other Values

Other values that were analyzed include noise and light, visual, public health and safety, and Indian trust resources.

3.8.1 Affected Environment

3.8.1.1 Noise and Light

The analysis area for noise and light can extend beyond the immediate project area because of the ability for noise and light to travel. Therefore, the analysis area is considered to be within 0.25 mile around the project area. The distance to the nearest residence is also considered as part of the analysis.

The compressor station would be located in a predominantly rural setting with associated low levels of ambient noise and few artificial light sources. The primary sources of human-made ambient noise and light emissions are vehicular traffic, agricultural activity, oil and gas drilling, and well pad construction activities (e.g., the use of bulldozers, drill rigs, and diesel engines; the flaring of gas; etc.). Drilling activities would typically take place 24 hours per day, and the drill rigs would be fitted with lighting for nighttime work.

3.8.1.2 Visual

Lake Sakakawea and rolling plains on the FBIR are typical views available to residents and travelers along area highways and roads. State Highway 22 is designated by North Dakota Parks and Recreation as part of the Killdeer Mountain Four Bears Scenic Byway, known for its scenic, cultural, and historical importance to North Dakota (North Dakota Parks and Recreation 2011a). The North Dakota Scenic Byways and Backways Program encourages all development projects within the immediate and distant viewshed of State Highway 22 to conserve the visual and aesthetic quality of the area. Therefore the analysis area for visual resources viewshed available from the project area. The distance to and the visibility of the project from the Killdeer Mountain Four Bears Scenic Byway (State Highway 22) is also considered during the analysis.

The proposed compressor station location is located 1.03 miles west of the Killdeer Mountain Four Bears Scenic Byway (State Highway 22). Agricultural fields and existing oil and gas–related development (well pads, access roads, utility corridors, and other facilities) are also present near the project area and influence the viewshed and scenic quality of the project area.

3.8.1.3 Public Health and Safety

The analysis area for public health and safety extends beyond the immediate project area because of the ability of leaks to go undetected and air quality emissions to be produced and present outside the project area. Therefore, the area and number of residence within a 1-mile radius of the project area is included in this analysis.

One residence is located within 1 mile of the proposed location of the compressor station. The nearest home is approximately 0.90 mile east of the proposed project area.

3.8.1.4 Indian Trust Resources

The compressor station would be situated on FBIR lands that encompass more than 1 million acres; although almost half of this acreage is held in trust by the United States for either the MHA Nation or individual allottees, the proposed project site is not held in trust and is under the purview of the TAT.

3.8.2 Environmental Consequences

3.8.2.1 Proposed Project

Noise and Light

Construction, proposed project would result in increased noise and light emissions from truck traffic and equipment operation. Noise impacts from actions at the project site would be localized and likely go unnoticed by the public. The EPA standard for acceptable environmental noise is 55 A-weighted decibels (dBA) because noise levels greater than this threshold could disturb local residents and displace area wildlife. Noise levels decrease over distance; noise levels from drill rigs are typically less than 55 dBA at 0.25 mile from the noise source (BLM 2006). The nearest residence is approximately 0.90 mile east of the proposed compressor station location, and noise levels would be expected to be less than 55 dBA at more than double the distance of 0.25 mile. Because of the distance from the project area to the nearest residence, noise impacts would not be anticipated to be significant. Noise effects to wildlife are addressed in Section 3.4.2.2.

Heavy truck traffic leaving the site and traveling through the FBIR would create more widespread and intermittent noise impacts. Heavy truck traffic during construction would produce the most noise. Additionally, suitable mufflers would be installed on all internal-combustion engines and certain compressor components to minimize noise levels. The compressor station would also be monitored remotely using SCADA systems to reduce traffic noise.

Compressor station facility lights vehicle lights would increase area light emissions and could be noticeable by nearby residents, recreationalists, or travelers along area roads during nighttime conditions. These light sources would be consistent with other existing light sources in the area, however, and would be temporary—ceasing upon completion of construction or drilling activities.

Visual

Construction of the compressor station and short access road would add to the visual presence of oil and gas development in the area. Surface disturbance and structures would contrast with the natural environment. However, facilities would be painted a color that would blend with the environment (shale green), and successful final reclamation would allow disturbed areas to be quickly absorbed into the natural landscape (see Section 2.1.2.2). The proposed compressor station would also be located approximately 1.03 mile from State Highway 22. Final reclamation and natural coloration of facilities would assist in minimizing visual impacts on the viewshed of the Killdeer Mountain Four Bear Scenic Byway and because of topography, ability to see the compressor station site from most of Highway 22 in this vicinity is impeded.

Public Health and Safety

Under the proposed project spills or leaks from the compressor station would be cleaned up and disposed of in accordance with appropriate regulations. Sewage would be contained in a portable chemical toilet during construction and all trash would be stored in a trash cage and hauled to an appropriate landfill during and after construction.

Health and safety concerns associated with compressor stations relate to air quality emissions and noise. Compressor stations can be a potential source of methane emissions. In 2012, EPA estimated that as many as 45% of CH_4 emissions in the natural gas transportation and storage sector were from traditional reciprocating compressors (the EPA estimated that the transportation and storage sector was responsible for 27% of overall methane emissions from the oil and gas industry).

Other potential health and safety effects to nearby residents from construction would consist of temporary increases in noise, fugitive dust, fire risk, and traffic hazards. These effects would be present during construction and operation as vehicles move on and off the site

Indian Trust Resources

The proposed project is not part of Indian Trust resources; therefore, no effects would occur.

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4.0 CUMULATIVE IMPACTS

Environmental impacts may accumulate either over time or in combination with similar events in the area. Unrelated and dissimilar activities may also have negative impacts on critical elements, thereby contributing to the cumulative degradation of the environment. Past and current disturbances near the project area include farming, grazing, roads, and other oil and gas wells. The cumulative impacts analysis area (CIAA) surrounding the project area may vary depending on the particular resource under consideration. Some effects would be localized, whereas others could be felt as far as 20 miles from the proposed project (Figure 4.1). For purposes of cumulative impacts analyses, landownership and the FBIR boundary are immaterial. Farming and grazing would be unlikely to contribute significantly to cumulative effects. Therefore, cumulative impacts analysis focuses on oil and gas development.

The FBIR and surrounding area are currently experiencing one of the largest oil and natural gas booms the United States has ever experienced. As of July 2016, there were 1,465 active wells and 539 permitted wells on the FBIR (North Dakota Industrial Commission 2017). North Dakota had 13,167 producing wells as of May 2016 (North Dakota Industrial Commission 2017). There are 13 active and confidential wells within a 1-mile CIAA surrounding the project area (Table 4.1). There are 265 active and confidential wells within a 5-mile CIAA; 1,102 active and confidential wells within a 10-mile CIAA; and 3,595 active and confidential wells within a 20-mile CIAA.

Reasonably foreseeable future impacts must also be considered. For the purposes of cumulative impacts analyses, the density of active and permitted oil wells and associated facilities (including compressor stations, access roads and utility corridors) is expected to increase steadily within the 20-mile CIAA over the next decade. From 2010 to 2029, it is estimated that 8,460 total new exploratory and development wells (on 6,765 pads) will be drilled. Of those exploratory and development pads, 5,711 pads will remain active and producing (BLM 2011). The EPA estimates that there could be approximately 2,000 new wells (or 1,000 well pads) on the FBIR between 2010 and 2029 (EPA 2012b). As has been discussed, compressor station are necessary for every 40 to 70 miles of pipeline. It can be assumed that as more wells are constructed, additional compressor stations would be necessary to facilitate the movement of oil and gas.

Table 4.1. Active, Confidential, and Permitted Wells in the CIAA

Well Type		
1-mile CIAA		
FBIR (on/off)	On	Off
Active wells	3	0
Confidential wells	8	0
Permitted wells	0	0
Cumulative total active and confidential wells within 1-mile CIAA: 11		
5-mile CIAA		
FBIR (on/off)	On	Off
Active wells	73	112
Confidential wells	57	23
Permitted wells	41	9
Cumulative total active and confidential wells within 5-mile CIAA: 265		
10-mile CIAA		
FBIR (on/off)	On	Off
Active wells	310	480
Confidential wells	189	123
Permitted wells	59	16
Cumulative total active and confidential wells within 10-mile CIAA: 1102		
20-mile CIAA		
FBIR (on/off)	On	Off
Active wells	1019	1,873
Confidential wells	338	365
Permitted wells	99	71
Cumulative total active and confidential wells within 20-mile CIAA: 3,595		
Cumulative total permitted wells within 20-mile CIAA: 170		

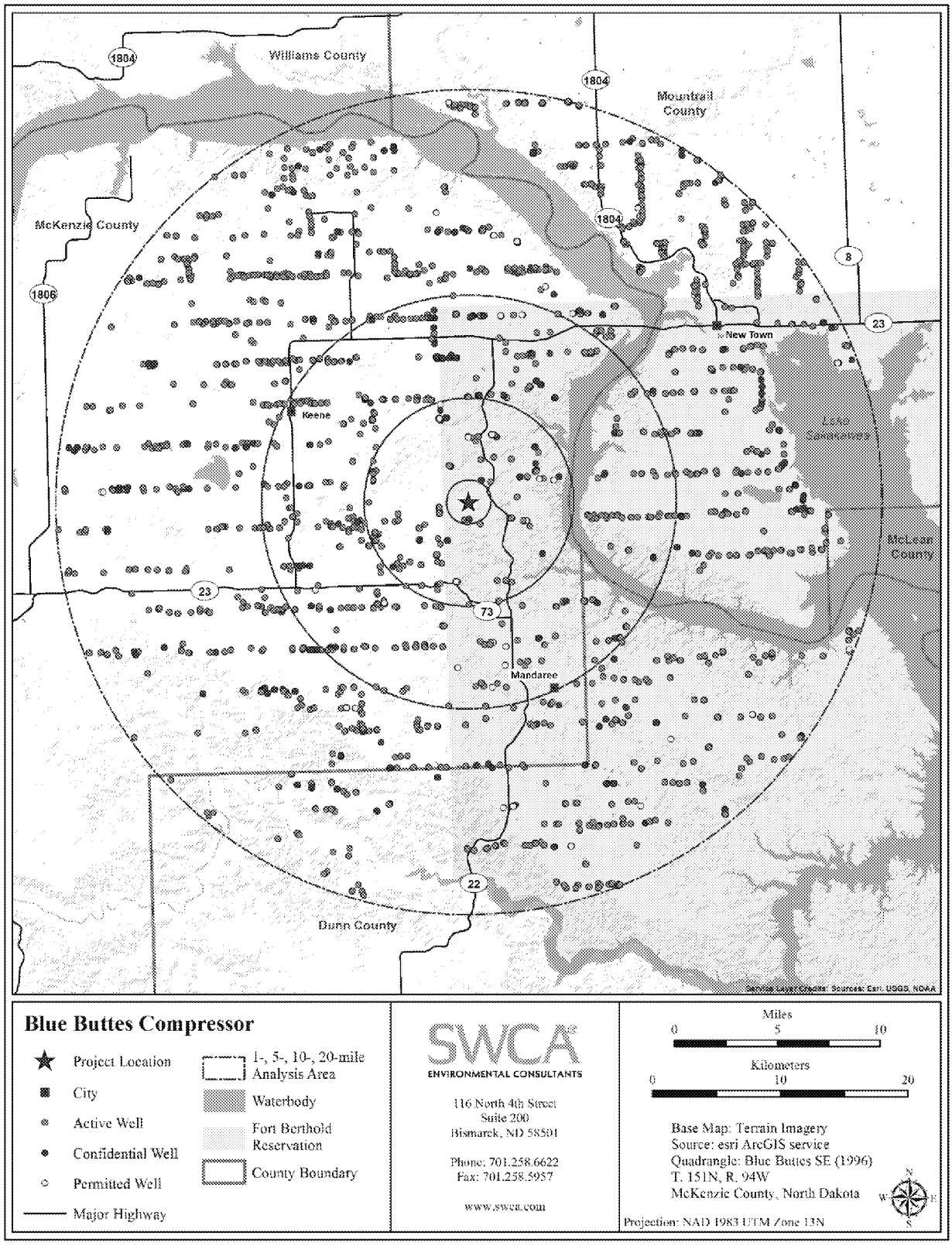

Figure 4.1. Active, confidential, and permitted wells within 1-, 5-, 10-, and 20-mile radii of the proposed project location.

4.1.1 Land Resources

4.1.1.1 Topography

Topographic changes resulting from construction-related excavation, including buildings, roads, well pads, and pipelines from cumulative projects, would result in minor but long-term impacts to the topography on the FBIR and throughout the 20-mile CIAA.

4.1.1.2 Soils

Soils across the project area could be affected by development activities, grazing, and agriculture, resulting in soil loss, compaction, and disturbance of undisturbed quality topsoil. The proposed project would result in 10.13 acres of long-term disturbance associated with the compressor station and access road (see Table 2.1) out of a total of 1,211,219 acres of land within the 20-mile CIAA. Similar levels of soil disturbance have occurred at 3,595 existing wells and 170 permitted wells within the 20-mile CIAA, as indicated in Table 4.1. Existing and future foreseeable oil and gas development is estimated to result in long-term disturbance to approximately 37,650 acres (10 acres per well), or approximately 3.1% of the available surface area within the 20-mile CIAA. The proposed project would result in an estimated relative incremental increase in long-term disturbance of 0.002% when added to the existing surface disturbance.

The proposed project also includes the creation of 0.03 mile of unpaved roadway. A portion of the access road ROW would be reclaimed on either side of the active roadway and Targa is committed to using BMPs to mitigate adverse effects. These BMPs would include implementing erosion- and sediment-control measures such as installing culverts with energy-dissipating devices to avoid sedimentation in ditches, constructing water bars alongside slopes, and planting cover crops to stabilize soil following construction and before permanent seeding takes place. Additional information regarding BMPs can be found in Section 2.1.2.

4.1.1.3 Geology

Oil and gas resources located on the FBIR are currently being developed, and it is reasonably foreseeable that this trend will continue at least through 2030. Sand and gravel removed from land areas for construction of access roads and well pads would be permanently relocated and converted to hard surface. Oil and gas removal is anticipated to continue with respect to the FBIR's resources, and these resources are not renewable once depleted. Although the proposed project represents a very small portion of the eventual overall oil and gas extraction and production of the FBIR's resources, the project would result in an incremental contribution to cumulative effects to geology overall.

4.1.2 Water Resources

No surface discharge of water would occur under the proposed project. Any surface or groundwater used during project development would come from an approved commercial source. The proposed project, when combined with other actions likely to occur in and near the project area in the future (cattle grazing, other oil and gas development, and agriculture), would increase sedimentation and runoff rates. Sediment yield from active roadways could occur at higher rates than background rates and could continue indefinitely. Therefore, the proposed project could

incrementally add to existing and future sources of water-quality degradation in the Clarks Creek subwatershed, but increases in degradation would be reduced by Targa's commitment to minimizing disturbance, using erosion-control measures (such as installing matting and straw rolls on exposed slopes and constructing culverts at stream crossings), and implementing BMPs designed to reduce impacts.

No adverse impacts to potable water aquifers and associated groundwater wells are anticipated from the development of the proposed compressor station and access road. Therefore, the proposed project would not contribute to cumulative effects.

4.1.3 Air Quality

Nearly 30% of North Dakota gas is currently being burned off, or flared, each month as a product of oil production (Helms 2016). For comparison, Alaska and Texas flare less than 1% of the natural gas produced. This is because oil production from the Bakken is much more recent than in those areas, and the area lacks gathering infrastructure for capturing natural gas. The FBIR FIP and NSPS OOOO require operators to capture produced natural-gas emissions, as opposed to routing the emissions to a control device, whenever economically feasible (EPA 2012b). The proposed project would not result in additional flaring but would incrementally contribute to NOx, CO, and VOC emissions.

As outlined in Section 3.3, exploratory drilling activities for the proposed project would result in GHG emissions. While the cumulative effect of climate change in the proposed project area may be major and long term, it is difficult to state with certainty what the proposed project would contribute to those climate impacts. As a result, any attempt to analyze and predict the local or regional impacts of the proposed project on GHG emissions cannot be done in any way that produces reliable results.

With the expected growth in oil and gas exploration, and the potential subsequent extraction and production of these resources, the cumulative effects of the emissions from these sources would be expected to decrease air quality. The proposed project would represent a small portion of the potential cumulative effects of increased oil and gas activities on air quality in the analysis area, and would result in an incremental contribution to cumulative effects to air quality overall.

4.1.4 Biological Resources

4.1.4.1 Ecosystems, Habitats, and Vegetation

No direct wetland impacts would occur as a result of the proposed project. Wetlands in the 1-mile CIAA could be affected primarily by erosion, sedimentation, and spills or other indirect effects on surface-water quality. Past, present, and reasonably foreseeable future oil and gas drilling activities in the area would likely lead to increased sediment loads being deposited in PEM wetlands and streams. Adherence to BMPs and site-specific erosion-control measures identified for this project (see Section 2.1.2) would prevent long-term erosion and sedimentation from the proposed project and would therefore not contribute to a cumulative effect. The use of similar site-specific measures for all future permitted and proposed well drilling would provide strong protections to keep erosion at very low levels and keep future development from adversely affecting wetland functions or quality.

Vegetation resources across the project area could be affected by various activities, including additional energy development and surface disturbance of high-quality native prairie areas that have been largely undisturbed by development activities, grazing, and agriculture. Indirect impacts to native vegetation may be possible as a result of soil loss, compaction, and increased encroachment of unmanaged invasive and noxious weed species. Continued oil and gas development within the FBIR could result in the loss and further fragmentation of native mixed-grass prairie habitat. As described above in Section 4.1.1.2, the proposed project would disturb less than 0.002% of the overall land area. Because of the small size in relation to the overall land area, the proposed project would constitute a very small incremental addition to cumulative effects.

4.1.4.2 Wildlife

Overall, oil and gas development on the FBIR is affecting wildlife and their habitats from conversion of existing undeveloped areas where wildlife have unrestricted access to developed areas with disturbance such as noise, human activities, and vehicles. This can lead to habitat fragmentation, loss of breeding and foraging habitat, and behavioral changes. The trend on the FBIR indicates that oil and gas development will continue to increase, and these effects to wildlife and their habitats would be expected to become more noticeable. However, the proposed project would include BMPs and other measures (see Section 2.1.2) to avoid and minimize potential effects to wildlife and habitats. In addition, with the relatively small size of the proposed project (10.13 acres) and the availability of other FBIR habitats for wildlife to use, the proposed project's incremental contribution to cumulative effects would be very small.

4.1.5 Cultural Resources

The number of oil wells, both active and permitted, is used as an indicator of the extent of all development activities that might affect cultural resources. Significant archaeological resources are irreplaceable and often unique; any damage or destruction of such resources can be expected to diminish the archaeological record as a whole. Unlike biological resources, cultural resources are historic point locations, fixed in place, that do not respond to outside influence. Thus, cumulative effects can be avoided through the required field evaluation and shifting of disturbance to avoid identified resources. Because this protocol would be followed, no cumulative impacts to the archaeological record would occur as a result of the proposed project.

4.1.6 Socioeconomics

The proposed project would incrementally add to existing and future socioeconomic impacts in the CIAA, which is the same as the analysis area for socioeconomics. The compressor station would support existing and planned oil and gas well development on the FBIR, which provides revenue to the MHA Nation and for some allottees. The proposed project could also, in conjunction with other oil and gas developments, increase short-term employment opportunities and income for residents. The addition of these actions, when considered with other development in the CIAA, is expected to result in beneficial cumulative economic effects based on improving economic trends as a result of oil and gas development throughout the CIAA over the past decade.

No changes to population, housing, or demand for community infrastructure and public services are anticipated for the proposed project. Changes to lifestyle and cultural values from current oil

and gas development are occurring in the analysis area. These changes affect the day-to-day lives of analysis area residents, including MHA Nation members. However, participation of the BIA and MHA Nation staff in the site-specific planning for the proposed project and surrounding oil and gas development is intended to minimize social and cultural impacts and avoid adverse impacts to the overall character of the analysis area. Therefore, the proposed project's incremental contribution to cumulative effects for these social aspects would not be considered significant.

Discussion of cumulative effects involving non-socioeconomic resources potentially affecting environmental justice—air quality, water quality, noise, and hazardous materials—is provided in other sections. However, because the addition of these actions with the effects from the proposed project would not result in disproportionate adverse impacts on environmental justice communities, the project would not contribute to cumulative effects for environmental justice.

4.1.7 Resource Use Patterns

4.1.7.1 Recreation

Oil and gas development associated with the proposed project would contribute incrementally to cumulative impacts to recreation within the area surrounding the project area. There are 265 active, confidential, and permitted wells within 5 miles of the proposed compressor station location (see Table 4.1). The proposed development, in combination with these existing and anticipated oil and gas developments, would likely reduce some recreational opportunities and the quality of the recreational experience. Surface disturbance and construction, drilling, and completion activities could alter habitat for game species, causing them to disperse to other areas within and outside the FBIR. Hunting opportunities could be reduced on the FBIR, and the setting for those seeking a sense of naturalness and solitude during recreational activities also could be reduced. Because of the relatively small size of the location that would be used for the proposed project and the availability of undisturbed areas available in the general area of the compressor station site the proposed project's incremental contribution to cumulative effects would not be considered significant.

4.1.7.2 Mineral Extraction

The proposed project would support existing and planned oil and gas development on the FBIR and therefore would contribute incrementally to cumulative impacts from extraction and consumption of oil and natural gas from the Bakken Formation. Currently 3,595 active, confidential, and permitted wells are extracting oil from the Bakken in the 20-mile CIAA (see Table 4.1). On the FBIR, the EPA estimates that there could be approximately 2,000 new wells between 2010 and 2029 (EPA 2012b). Overall production in 2013 for North Dakota was 297,576,174 barrels from 6,862 producing wells (North Dakota Oil and Gas Division 2017).

4.1.7.3 Transportation Networks

Oil and gas development associated with the proposed project would contribute incrementally to cumulative impacts to transportation. Traffic would increase on roads within the 20-mile CIAA as a result of existing, proposed, and future development of wells and associated infrastructure (e.g. compressor stations). Trucks, including those with heavy loads, would use state, county, and BIA roads to access the 3,765 existing and permitted wells, the proposed wells, and future wells within the 20-mile CIAA as well as existing and future associated infrastructure. NDDOT highways within this CIAA include State Highways 22, 23, and 73. Truck traffic along these highways and secondary roads may be noticeable to individuals who live and work in Four Bears Village, New Town, Keene, and Mandaree, especially those who use BIA Road and State Highway 22.

Existing major highways and paved county and BIA roads may be adequate to handle anticipated increases in passenger traffic volume and size. The proposed project would not result in a significant contribution to traffic impacts, but that contribution, when combined with projected heavy truck traffic from hundreds of other new wells and associated infrastructure previously authorized on and off the FBIR, would create the potential for short-term adverse impacts to these roads, particularly gravel roads. Without additional funding for road repair and improvement projects, these cumulative impacts could become prolonged for many of the state highways and county and BIA roads. Operators, agencies, and the MHA Nation are developing and implementing cooperative efforts to address road conditions and traffic; these efforts will address past activities and continue to minimize and mitigate potential future activities.

4.1.8 Other Values

4.1.8.1 Noise and Light

The proposed project would contribute incrementally short-term cumulative impacts from noise associated with construction, drilling, and completion activities. Artificial lighting and flaring associated with drilling and completion operations in the 1-mile CIAA would also increase light emissions and affect viewing of the night sky. Because of the relatively small size of the proposed project and limited sources of existing noise and light emissions, the incremental contribution to cumulative effects would not be considered significant.

4.1.8.2 Visual

The proposed project would contribute incrementally to cumulative impacts from oil and gas development in the 1-mile CIAA. There are 11 existing well locations with associated roads and infrastructure within the 1-mile CIAA that could affect the area's scenic quality. However, this level of dispersed development would have a minor level of visual impact to residents or recreationists in the 1-mile CIAA or those driving through the CIAA on State Highway 22. Because of the relatively small size of the proposed project, the incremental contribution to cumulative effects would not be considered significant.

4.1.8.3 Public Health and Safety

The main cumulative effect of the existing and proposed wells and other foreseeable future well-field development on public health and safety is related to the possible accidental release of petroleum, drilling or HF fluids, or H_2S into the environment. The proposed project would support existing wells and future oil and gas wells that would add to the cumulative total of 3,595 existing active and confidential wells located within the 20-mile CIAA. Maintaining adequate setbacks from residences, along with adequate spill prevention measures and other emergency plans, would generally prevent hazardous materials from coming into direct contact with drinking water, surface water, and groundwater or with residential populations of wells. However, the risk of accidental release of toxic or hazardous substances would never be completely eliminated. Therefore, the proposed project would incrementally contribute to a potential cumulative impact on public health and safety in the 20-mile CIAA.

4.1.8.4 Indian Trust Resources

The proposed project is not located on lands held in trust by the United States and therefore would not contribute to any cumulative effects to these resources.

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5.0 REFERENCES

AMEC Environment & Infrastructure, Inc. 2013. *Clean Air Status and Trends Network (CASTNET) 2011 Annual Report.* Prepared for the U.S. Environmental Protection Agency, Office of Air and Radiation, Clean Air Markets Division, Washington, D.C., EPA Contract No. EP-W-09-028. AMEC Environment & Infrastructure, Inc.

Baer, S., and M. Retter. 2011. *A Class I and Class III Cultural Resource Inventory of the Independence Grace #150-94-06A-07H, Shell Creek #150-94-06A-07H TF, Nishu #150-94-06B-07H, and Sanish #150-94-06B-07H TF Well Pad and Access Road/Utility Corridor, Fort Berthold Indian Reservation, McKenzie County, North Dakota.* Final report. Bismarck, North Dakota: SWCA Environmental Consultants.

Bishaw, A. 2013. Poverty: 2000 to 2012. In *American Community Survey Briefs.* Available at: https://www.census.gov/prod/2013pubs/acsbr12-01.pdf. Accessed April 16, 2014.

Bluemle, J.P. 1971. *Geology of McLean County, North Dakota.* Bulletin 60, Part I. Grand Forks: North Dakota Geological Survey.

———. 1989. *Geology of Renville and Ward Counties, North Dakota.* Bulletin 50, Part I. Bismarck: North Dakota Geological Survey.

Bryce, S., J.M. Omernik, D.E. Pater, M. Ulmer, J. Schaar, J. Freeouf, R. Johnson, P. Kuck, and S.H. Azevedo. 1998. Ecoregions of North Dakota and South Dakota. Map. Available at: ftp://newftp.epa.gov/EPADataCommons/ORD/Ecoregions/nd/ndsd_front.pdf. Accessed July 1, 2016.

Bureau of Indian Affairs (BIA). 2001. *2001 American Indian Population and Labor Force Report.* U.S. Department of the Interior, Bureau of Indian Affairs. Available at: http://www.indianaffairs.gov/cs/groups/public/documents/text/idc-001190.pdf. Accessed December 2009.

———. 2005. *2005 American Indian Population and Labor Force Report.* U.S. Department of the Interior, Bureau of Indian Affairs. Available at: http://www.indianaffairs.gov/cs/groups/public/documents/text/idc-001719.pdf. Accessed December 2013.

———. 2010. *Environmental Assessment: Saddle Butte Pipeline, LLC, Red Tipped Arrow 33-11H Well Site to Bear Paw Energy Connection* (FONSI issued February 2010).

———. 2014a. 2013 *American Indian Population and Labor Force Report.* U.S. Department of the Interior, Bureau of Indian Affairs. Available at: http://www.indianaffairs.gov/cs/groups/public/documents/text/idc1-024782.pdf. Accessed April 1, 2014.

———. 2014b. Fort Berthold Agency. Available at: http://www.bia.gov/WhoWeAre/RegionalOffices/GreatPlains/WeAre/Agencies/FortBerthold/index.htm. Accessed April 2014.

———. 2017. Categorical Exclusion 516 DM 10.5 F (1) & 516 DM 10.5 G (3) for the Targa Badlands, LLC, Blue Buttes Loop Pipeline Along Existing Pipeline and Well Pad Rights-of-Way, Fort Berthold Indian Reservation. April 24.

Bureau of Indian Affairs (BIA) and U.S. Environmental Protection Agency (EPA). 2009. *Final Environmental Impact Statement for the Mandan, Hidatsa, and Arikara Nation's Proposed Clean Fuels Refinery Project*. U.S. Department of the Interior, Bureau of Indian Affairs, Great Plains Regional Office, and U.S. Environmental Protection Agency, Region 8. Available at: https://www.epa.gov/sites/production/files/documents/TAT_FEIS_Sum-Chp1.pdf. Accessed May 15, 2015.

Bureau of Labor Statistics. 2013. Quarter 1 2013 North Dakota state and county quarterly census of employment and wages map data. Available at: http://beta.bls.gov/maps/cew/ND?period=2013-Q1&industry=10&geo_id=38000&chartData=3&distribution=Quantiles&pos_color=blue&neg_color=orange&showHideChart=show&ownerType=0. Accessed December 16, 2013.

Bureau of Land Management (BLM). 2006. *Final Environmental Impact Statement for the Jonah Infill Drilling Project, Sublette County, Wyoming*. Pinedale, Wyoming: BLM Wyoming State Office, BLM Pinedale Field Office, and Rock Springs Field Office.

———. 2011. Air Resource BMPs: Best Management Practices for Fluid Minerals. Updated May 9, 2011. Presentation. U.S. Department of the Interior, Bureau of Land Management. Available at: http://www.blm.gov/style/medialib/blm/wo/MINERALS__REALTY__AND_RESOURCE_PROTECTION_/bmps.Par.60203.File.dat/WO1_Air%20Resource_BMP_Slideshow%2005-09-2011.pdf. Accessed April 7, 2014.

Bureau of Land Management (BLM) and U.S. Forest Service. 2007. *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development: The Gold Book*. 4th ed. BLM/WO/ST-06/021+3071/REV 07. Denver, Colorado: Bureau of Land Management and U.S. Forest Service.

Carlson, C.G. 1973. *Geology of Mercer and Oliver Counties, North Dakota*. Bulletin 56, Part I. Grand Forks: North Dakota Geological Survey.

———. 1985. *Geology of McKenzie County, North Dakota*. Bulletin 80, Part I. Grand Forks: North Dakota Geological Survey.

Carlson McCain, Inc. 2016. Bald and Golden Eagle Nest Status 2016 Aerial Survey for Fort Berthold Indian Reservation. Spring 2016. Data received from Carlson McCain on May 18, 2016.

Clayton, L. 1972. *Geology of Mountrail County, North Dakota*. Bulletin 55, Part IV. Grand Forks: North Dakota Geological Survey.

Council on Environmental Quality (CEQ). 2016. *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews*. August 5, 2016. Available at: https://www.federalregister.gov/documents/2016/08/05/2016-18620/final-guidance-for-federal-departments-and-agencies-on-consideration-of-greenhouse-gas-emissions-and. Accessed March 8, 2017.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. FWS/OBS-79/31. Washington, D.C.: U.S. Department of the Interior, U.S. Fish and Wildlife Service.

Croft, M.G. 1985. Groundwater resources of McKenzie County, North Dakota. Bulletin 80, Part III. Bismarck: North Dakota Geological Survey. Available at: http://www.swc.state.nd.us/info_edu/reports_and_publications/county_groundwater_studies/pdfs/McKenzie_Part_III.pdf. Accessed April 13, 2016.

Economic Research Service. 2010. County-level unemployment and median household income data for North Dakota. Available at: https://data.ers.usda.gov/reports.aspx?ID=17828 Accessed May 18, 2017.

———. 2011. County level unemployment and median household income for North Dakota. Available at: http://www.ers.usda.gov//data-products/county-level-data-sets/unemployment.aspx?ST=ND.+Accessed+March+11%2c+2011. Accessed March 11, 2011.

Energy Information Administration. 2006. *Technology-based Oil and Natural Gas Plays: Shale Shock! Could there be Billions in the Bakken?* Energy Information Administration, Office of Oil and Gas, Reserves and Production Division.

Federal Register. 2013. *Approval and Promulgation of Federal Implementation Plan for Oil and Natural Gas Well Production Facilities; Fort Berthold Indian Reservation (Mandan, Hidatsa, and Arikara Nation), North Dakota; Rule*.

Fort Berthold Housing Authority. 2008. Mandan, Hidatsa, Arikara website. Available at: http://www.mhanation.com/main2/history/PDFs/Economic%20and%20Social%20Change.pdf. Accessed April 4, 2017.

Hagen, S.K., P.T. Isakson, and S.R. Dyke. 2005. *North Dakota Comprehensive Wildlife Conservation Strategy*. Bismarck: North Dakota Game and Fish Department.

Headwaters Economics. 2012. Economic Profile System. Search results containing demographics for Dunn, McKenzie, McLean, and Mountrail Counties, North Dakota, and the Fort Berthold Indian Reservation. Available at: http://headwaterseconomics.org/tools/economic-profile-system/about/. Accessed May 23, 2012.

Helms, Lynn. 2016. *Director's Cut.* North Dakota Industrial Commission, Department of Mineral Resources. Available at: https://www.dmr.nd.gov/oilgas/directorscut/directorscut-2016-03-11.pdf. Accessed April 1, 2016.

Interagency Monitoring of Protected Visual Environments. 2016. Regional Haze Rule Summary Data 1988–2015. Available at: http://vista.cira.colostate.edu/Improve/rhr-summary-data/. Accessed May 18, 2017.

Intergovernmental Panel on Climate Change (IPCC). 2013. Climate Change 2013: The Physical Science Basis, Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Available at: http://www.climatechange2013.org/images/report/WG1AR5_SPM_FINAL.pdf. Accessed March 8, 2017.

Klausing, R.L. 1979. *Ground-Water Resources of Dunn County, North Dakota*. Bulletin 68, Part III. Bismarck: North Dakota Geological Survey. Available at: http://www.swc.state.nd.us/info_edu/reports_and_publications/county_groundwater_studies/pdfs/Dunn_Part_III.pdf. Accessed April 13, 2016.

Macy, J. 2011. *Blue Buttes Natural Gas Gathering Line: A Class III Cultural Resource Inventory in McKenzie County*. An unpublished report on file at the North Dakota State Historic Preservation Office, Bismarck, North Dakota.

Mandan, Hidatsa, and Arikara (MHA) Nation. 2011. *Resolution #11-80-VJB. Resolution of the Governing Body of the Three Affiliated Tribes of the Fort Berthold Indian Reservation; A Resolution Entitled "Adoption of Civil Motor Vehicle Code."* Adopted by the Three Affiliated Tribes Business Council on August 11, 2011. Available at: http://www.mhanation.com/main2/elected_officials/elected_officials_resolutions/resolutions_2011/Aug%2011%202011%20Meeting.pdf. Accessed April 3, 2014.

Murphy, E. 2001. *Geology of Dunn County, North Dakota*. Bulletin 68, Part I. Bismarck: North Dakota Geological Survey.

Natural Resources Conservation Service (NRCS). 1998. *National Forestry Manual*. 190-V-NFM. U.S. Department of Agriculture, National Resources Conservation Service.

———. 2016a. Web Soil Survey. Soil Survey Geographic (SSURGO) Database for Dunn and McKenzie Counties, North Dakota. Available at: http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm. Accessed August 11, 2016.

———. 2016b. Ecological Site Descriptions. Available at: https://esis.sc.egov.usda.gov/Welcome/pgReportLocation.aspx?type=ESD. Accessed May 18, 2017.

North Dakota Department of Agriculture (NDDA). 2016. 2016 noxious weed list survey – reported acres. Available at: http://agdepartment.vision-technology.com/weedsurvey/report.asp. Accessed May 19, 2017.

———. 2017. North Dakota County and City Listed Noxious Weeds. Revised February 2017. Available at: https://www.nd.gov/ndda/files/2-9-17_City_County_Noxious_Weeds_List.pdf. Accessed May 19, 2017

North Dakota Department of Health (NDDH). 2014. *Annual Report: North Dakota Air Quality Monitoring Data Summary 2013*. Available at: http://www.ndhealth.gov/AQ/ambient/Annual%20Reports/ANN_13.pdf. Accessed April 1, 2016.

North Dakota Department of Health (NDDH), Division of Water Quality. 2014. Watershed boundary dataset. Available at: https://www.ndhealth.gov/WQ/Watershed_Boundary/. Accessed April 13, 2016.

North Dakota Industrial Commission. 2017. GIS Map Server. Available at: https://www.dmr.nd.gov/OaGIMS/viewer.htm/. Accessed May 22, 2017.

North Dakota Oil and Gas Division. 2017. GIS Map Server: Rig Locations. Available at: https://www.dmr.nd.gov/OaGIMS/viewer.htm. Accessed May 22, 2017.

North Dakota Parks and Recreation. 2011a. Killdeer Mountain Four Bears Scenic Byway. Available at: http://www.parkrec.nd.gov/byways/killdeer/killdeer.html. Accessed August 9, 2011.

———. 2011b. Scoping comment letter dated July 25, 2011, from Jesse Hanson, Coordinator of Planning and Natural Resource Division, North Dakota Parks and Recreation.

North Dakota State Climate Office. 2012. North Dakota state normal by region. Available at: https://www.ndsu.edu/ndsco/data/30yearaverage/#c343059. Accessed August 13, 2013.

North Dakota State Water Commission. 2017. North Dakota State Water Commission Mapservice. Available at: http://mapservice.swc.state.nd.us/. Accessed May 22, 2017.

Peterson, James A. 1995. *Williston Basin Province*. Available at: http://certmapper.cr.usgs.gov/data/noga95/prov31/text/prov31.pdf. Accessed August 15, 2016.

Schleicher, J. 2017. *A Class I and Class III Cultural Resources Inventory for the Blue Buttes Loop Compressor Station and Access Road, Fort Berthold Indian Reservation, McKenzie County, North Dakota*. Final report prepared for Targa Resources. Bismarck, North Dakota: SWCA Environmental Consultants.

Three Affiliated Tribes (TAT) and State of North Dakota. 2013. Oil and Gas Tax Agreement Between the TAT and ND. Signed by Tex Hall, TAT Chairman, and Jack Dalrymple, North Dakota Governor, on June 21, 2013 with effective date July 1, 2013. Available at: https://www.nd.gov/tax/data/upfiles/media/oilgastaxagreement.pdf?20160621031020. Accessed April 15, 2014.

Tribal Employment Rights Office (TERO). 2012. TERO Ordinance and Regulations of the Three Affiliated Tribes; Mandan, Hidatsa, and Arikara. Available at: http://www.mhatero.com/wp-content/uploads/2016/06/AXT_2_1ZF10.pdf. Accessed August 12, 2014.

U.S. Bureau of Economic Analysis. 2013. Online search tool for per capita income. Results for North Dakota by county. Available at: http://www.bea.gov/iTable/iTable.cfm?reqid=99&step=1#reqid=99&step=1&isuri=1. Accessed November 21, 2013.

U.S. Census Bureau. 2011. State and county QuickFacts. Available at: http://quickfacts.census.gov/qfd/states/38000.html. Accessed January 24, 2011.

———. 2013a. 2010 Census Interactive Population Search. Available at: http://www.census.gov/2010census/popmap/ipmtext.php. Accessed December 18, 2013.

———. 2013b. Building permits annually in North Dakota counties. Estimates with imputation. Available at: http://censtats.census.gov/bldg/bldgprmt.shtml. Accessed December 18, 2013.

———. 2016a. American FactFinder. Online search tool (advanced search) for median rent. Results for Dunn, McKenzie, McLean, and Mountrail Counties, North Dakota, in 2000. Available at: http://factfinder.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t. Accessed July 1, 2016.

———. 2016b. American FactFinder. Online search tool (advanced search) for median rent. Results for Dunn, McKenzie, McLean, and Mountrail Counties, North Dakota, in 2012: Available at: http://factfinder.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t. Accessed July 1, 2016.

———. 2016c. 2010–2014 American Community Survey 5-Year Estimates. Available at: https://www.census.gov/programs-surveys/acs/news/data-releases.html. Accessed March 23, 2016.

U.S. Environmental Protection Agency (EPA). 2012a. 2012 Waterbody Report for Lake Sakakawea. Available at: https://ofmpub.epa.gov/waters10/attains_waterbody.control?p_au_id=ND-10110101-021-L_00&p_cycle=2012. Accessed on May 22, 2017.

———. 2012b. *Technical Support Document: Federal Implementation Plan for Oil and Natural Gas Well Production Facilities; Fort Berthold Indian Reservation (Mandan, Hidatsa, and Arikara Nations), North Dakota*. Available at: https://www.regulations.gov/contentStreamer?documentId=EPA-R08-OAR-2012-0479-0004&contentType=pdf. Accessed March 8, 2017.

———. 2013. Approval and Promulgation of Federal Implementation Plan for Oil and Natural Gas Well Production Facilities; Fort Berthold Indian Reservation (Mandan, Hidatsa, and Arikara Nation), North Dakota. Final rule. *Federal Register* 78(56):17836–17864.

———. 2015. Greenhouse Gas Reporting Program 2014: Petroleum and Natural Gas Systems. Available at: https://www.epa.gov/ghgreporting/ghgrp-2014-petroleum-and-natural-gas-systems. Accessed January 13, 2016.

———. 2016. Federal Implementation Plan for True Minor Sources in Indian Country in the Oil and Natural Gas Production and Natural Gas Processing Segments of the Oil and Natural Gas Sector; Amendments to the Federal Minor New Source Review Program in Indian Country To Address Requirements for True Minor Sources in the Oil and Natural Gas Sector. Final rule. *Federal Register* 87(107):35944–35981.

———. 2017a. Watershed Assessment, Tracking & Environmental Results. Available at: http://www.epa.gov/waterdata/waters-watershed-assessment-tracking-environmental-results-system. Accessed May 22, 2017.

———. 2017b. National Ambient Air Quality Standards (NAAQS). Available at: https://www.epa.gov/criteria-air-pollutants/naaqs-table. Accessed April 1, 2016.

———. 2017c. AP-42: Compilation of Air Emission Factors, Environmental Protection Agency. Available at: https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emission-factors, accessed May 25, 2017.

U.S. Fish and Wildlife Service (USFWS). National Wetlands Inventory wetlands mapper. Available at: http://www.fws.gov/wetlands/Data/Mapper.html. Accessed July 25, 2016.

———.2016b. IPaC Information for Planning and Conservation. Online search tool. Available at: https://ecos.fws.gov/ipac/gettingStarted/map. Accessed August 8, 2016.

6.0 ABBREVIATIONS

°F	degrees Fahrenheit
µg/m^3	micrograms per cubic meter
AAQS	ambient air quality standards
BGEPA	Bald and Golden Eagle Protection Act
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMP	best management practice
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CH_4	methane
CIAA	cumulative impact analysis area
CI ICE	Stationary Compression Ignition Internal Combustion Engines
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	equivalent carbon dioxide
compressor station	Blue Buttes Compressor Station
CWA	Clean Water Act
dBA	decibels
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FBIR	Fort Berthold Indian Reservation
FIP	Federal Implementation Plan
gal/min	gallons per minute
GHG	greenhouse gas
GIS	geographic information system
GPS	global positioning system
H_2S	hydrogen sulfide
HAP	hazardous air pollutant
HF	hydraulic fracturing
HUC	hydrologic unit code
IPCC	Intergovernmental Panel on Climate Change
kg/ha/yr	kilograms per hectare per year
km	kilometer(s)
MBTA	Migratory Birds Treaty Act
MHA Nation	Three Affiliated Tribes of the Mandan, Hidatsa, and Arikara Nation
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NDDA	North Dakota Department of Agriculture
NDDH	North Dakota Department of Health
NDDOT	North Dakota Department of Transportation
NEPA	National Environmental Policy Act
NESHAPs	National Emissions Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide

NO_x	mono-nitrogen oxides, referring to nitric oxide and nitrogen dioxide
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSPS	New Source Performance Standards
NSR	New Source Review
NWI	National Wetlands Inventory database of the USFWS
O_3	ozone
PEM	palustrine freshwater emergent
PM	particulate matter
ppb	parts per billion
ppm	parts per million
PSD	Prevention of Significant Deterioration
ROW	right-of-way
SCADA	supervisory control and data acquisition
SI ICE	Stationary Spark Ignition Internal Combustion Engines
SO_2	sulfur dioxide
SVR	standard visual range
SWCA	SWCA Environmental Consultants
Targa	Targa Corporation
TAT	Three Affiliated Tribes
TDS	total dissolved solids
TERO	Tribal Employment Rights Office
THPO	Tribal Historic Preservation Officer
TRNP	Theodore Roosevelt National Park
USACE	U.S. Army Corps of Engineers
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compound

APPENDIX A

Natural Resources Conservation Service Soil Descriptions and Attributes

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Part I. NRCS Map Unit Descriptions (Source: NRCS 2016)

Map unit: E0701F - Dogtooth-Janesburg-Cabba Map unit: a complex, 6 to 35 percent slopes

Component: Dogtooth (35%)

The Dogtooth component makes up 35 percent of the map unit. Slopes are 6 to 25 percent. This component is on ridges on uplands. The parent material consists of clayey residuum weathered from shale. Depth to a root restrictive layer, bedrock, paralithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is very low. Shrink-swell potential is high. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. This component is in the R054XY033ND Thin Claypan ecological site. Non-irrigated land capability classification is 7s. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 9 percent. The soil has a moderately saline horizon within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 15 within 30 inches of the soil surface.

Component: Janesburg (25%)

The Janesburg component makes up 25 percent of the map unit. Slopes are 6 to 25 percent. This component is on ridges on uplands. The parent material consists of clayey residuum weathered from shale. Depth to a root restrictive layer, bedrock, paralithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is low. Shrink-swell potential is high. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. This component is in the R054XY021ND Claypan ecological site. Non-irrigated land capability classification is 6s. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 9 percent. The soil has a slightly saline horizon within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 15 within 30 inches of the soil surface.

Component: Cabba (22%)

The Cabba component makes up 22 percent of the map unit. Slopes are 9 to 35 percent. This component is on ridges on uplands. The parent material consists of fine-loamy residuum weathered from sedimentary rock. Depth to a root restrictive layer, bedrock, paralithic, is 10 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R054XY030ND Shallow Loamy ecological site. Non-irrigated land capability classification is 7e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 15 percent. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map Unit: E3541C – Williams-Zahl loams, 6 to 9 percent slopes

Component: Williams (39%)

The Williams component makes up 39 percent of the map unit. Slopes are 6 to 9 percent. This component is on knolls on till plains. The parent material consists of fine-loamy till. Depth to a

root-restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is high. Shrink-swell potential is moderate. This soil is not flooded and it is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 4 percent. This component is in the R054XY031ND Loamy ecological site. Non-irrigated land capability classification is 3e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 15 percent.

Component: Zahl (36%)

The Zahl component makes up 36 percent of the map unit. Slopes are 6 to 9 percent. This component is on knolls on till plains. The parent material consists of fine-loamy till. Depth to a root-restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is high. Shrink-swell potential is moderate. This soil is not flooded or ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R054XY038ND Thin Loamy ecological site. Non-irrigated land capability classification is 4e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 15 percent.

Map unit: E3555D – Zahl-Williams loams, 9 to 15 percent slopes

Component: Zahl (45%)

The Zahl component makes up 45 percent of the map unit. Slopes are 9 to 15 percent. This component is on hills on till plains. The parent material consists of fine-loamy till. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is high. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the R054XY038ND Thin Loamy ecological site. Non-irrigated land capability classification is 6e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 15 percent.

Component: Williams (22%)

The Williams component makes up 22 percent of the map unit. Slopes are 9 to 15 percent. This component is on hills on till plains. The parent material consists of fine-loamy till. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is high. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 4 percent. This component is in the R054XY031ND Loamy ecological site. Non-irrigated land capability classification is 4e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 15 percent.

Source

Natural Resources Conservation Service. 2016. Web Soil Survey. Soil Survey Geographic (SSURGO) Database for Dunn and McKenzie Counties, North Dakota. Available at: http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm. Accessed March 8, 2017.

Part II. Soil Series in the Project Area

Map Unit	Survey Area	Soil Series	Landform	Slope (%)	Drainage	Restrictive Layer	Depth (inches)	Carbonate (%)	Organic Matter (%)	Sodium Adsorption Ratio	K Factor	Surface Runoff	Erodibility Rating	Reclamation Potential	Limitation	Prime Farmland	Ecological Site	Surface Disturbance (acres)	% of Surface Disturbance
E0701F	ND053	Dogtooth-Janesburg-Cabba complex, 6 to 35 percent slopes	Hills and ridges	17	Well drained	Paralithic bedrock	10-20	9-15	2-3	0-15	0.43	Very high	Severe	Poor	Sodium content, salinity, too clayey, slope, depth to bedrock, Exchange capacity	<Null>	Thin claypan (R054XY033ND) Claypan (R054XY021ND) Shallow loamy (R054XY030ND)	1.57	15.47
E3541C	ND053	Williams-Zahl loams, 6 to 9 percent slopes	Plains and rises	8	Well drained	<Null>	20-40	15	2-4	0	0.35	Moderate	Moderate	Good	<Null>	<Null>	Loamy (R054XY031ND) Thin Loamy (R054XY038ND)	8.54	84.14
E3555D	ND053	Zahl-Williams loams, 9 to 15 percent slopes	Hills and ridges	12	Well drained	<Null>	60	15	2-4	0-5	0.37	Moderate to high	Slight to moderate	Fair	Slope	<Null>	Loamy (R054XY031ND) Thin Loamy (R054XY038ND)	0.04	0.0039